

# The Electragist

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Association of Electragists  
INTERNATIONAL

JANUARY, 1927

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COMPLETE PRICES AND DATA ON

## Wakefield "Red Spot" Hangers

"Red Spot" Hangers are the accepted standard of quality for commercial lighting equipment, and are handled by over 150 leading electrical supply jobbers. They are designed to facilitate the work of wiring and installing, so that fixture hanging costs are substantially lower where Wakefield material is used.

"Red Spot" Hangers are made to the following rigid Wakefield Specifications which insure durability in service and permanence of finish.

### THE WAKEFIELD SPECIFICATIONS

These specifications apply only to the 1300, 1700, 1800 and 2600 series as listed herein.

#### SPECIFICATIONS FOR CHAIN HANGERS

Canopies: All canopies for single light pendants to be not less than 5 1/2" diameter, 3 1/2" deep and made of 22 B & S gauge brass, with adequate slip ring and set screw.

Canopy Extensions: There shall be available a proper canopy extension or other accessory of suitable design, and of finish identical with that of hanger, to provide for neat and proper fitting over and around all exposed outlet boxes and conduit.

Holders: All holders for single light pendants to be of 22 B & S gauge brass and equipped with three upset holder screws having leveled ends or other approved safe holding device. Sockets must be located at, or adjusted to, the position required to bring lamp in proper relation to the glassware specified. Holders for 200-watt units or larger to be equipped with a means or device to compensate for lack of balance in glassware so that complete units shall hang evenly. The inside of all holders to be coated with aluminum bronze.

Stems: All stems to consist of hard die cast loops tapped for 1/4" iron pipe nipple, 5 1/2" in length, 24 B & S gauge brass casing and 1/4" x 1/4" iron hickey.

Chains: All chains to be of solid brass not less than No. 5 B & S gauge, and having a tensile strength of not less than 120 lbs.

General: All units to be wired with No. 14 stranded asbestos covered wire. All units must have approval of National Board of Fire Underwriters. No sprayed-on finish shall be used on any unit.

#### SPECIFICATIONS FOR STEM CONSTRUCTION HANGERS

In replacing chain method of suspension, all stems shall consist of one pair of solid cast brass loops tapped for 1/4" iron pipe nipples and recessed for 24 B & S gauge brass casing, both upper and lower stems to have 1/4" iron pipe, upper to be standard length of 5 1/2" with 1/4" x 1/4" hickey, lower to be of a length according to the overall length of the fixture. All casing to be of 24 B & S gauge brass. All wireways to be properly reamed and free from rough edges.

#### SPECIFICATIONS FOR CEILING UNITS

Canopies: All canopies for 200-watt units or larger to be not less than 8" diameter and made of 22 B & S gauge brass. Canopies to be mounted on a steel strap suitable for attaching to lugs of outlet box or fixture stud by means of locknut.

Holders: All holders for ceiling units to be of 22 B & S gauge brass and equipped with three upset holder screws having leveled ends or other approved safe-holding device. Sockets must be located at or adjusted to position required to bring lamp in proper relation to the glassware specified. The inside of all holders to be coated with aluminum bronze.

General: All units to be wired with stranded asbestos covered wire. All units must have approval of National Board of Fire Underwriters. No sprayed-on finish shall be used on any unit.

The F. W. Wakefield Brass Co. - Manufacturers - Vermilion, Ohio, U.S.A.

## STOP FIGURING for the Other Fellow

NEXT TIME you estimate on a commercial lighting job, do a little figuring for yourself.

Figure how to make a profit, not how to shave a price. Figure the cost of the equipment in-

stalled, not its price according to a discount sheet. Figure how to sell the job, not how to skimp it.

Nine buyers in ten are willing to pay a profit to the man who furnishes a good job at a fair price.



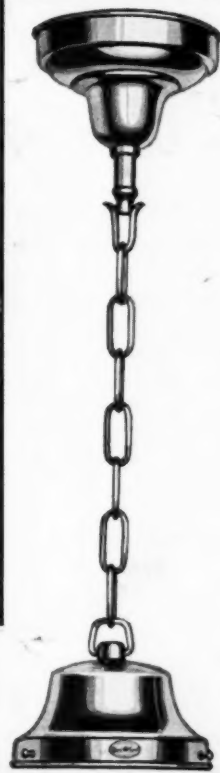
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### MINUTES SAVED

You save seven to ten minutes of your workman's time on every "Red Spot." When "Red Spots" arrive on the job they are ready to install—no reaming, no tapping, no manufacturing. They are quick to wire, easy to hang, and the glass balances almost automatically.

Your profit is not only surer, but it is larger, when you install "Red Spots"—and the customer is better satisfied.

Send for the new Complete "Red Spot" Catalog, shown above or, better still, write us about that commercial lighting job you're interested in and we will help you land it.



## The F. W. WAKEFIELD BRASS CO.

Vermilion, Ohio, U. S. A.

Riveted and welded corners

Slate Base

Large cast left hand bearing

Ample wiring space

Concentric knockouts just where you want them

Simple, positive, quick break

Malleable cast handle

Slotted screw driver nuts

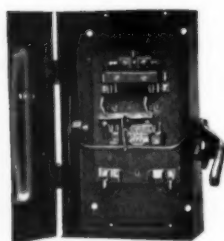
Type "C"  
Safety Switch

## A Good All-round Safety Switch

This Type "C" Safety Switch is the very best switch of its kind made. It is just what we call it, a good all-round Safety Switch, and moderately priced. Ruggedly constructed, superior in design and construction to any other make, it may well be called the general utility switch.

Some of the important points of superiority are indicated above. The operation of this switch is simple and positive, special stops regulate the distance of the throw so that it will be thrown in or out properly. This switch is made in all sizes up to 2000 amperes, 250 to 500 volts.

These Type "C" safety switches supplement our line of higher priced Type "A" Switches for mill purposes.



Type "C" Safety Switch  
for grounded neutral  
systems

An addition to the Type "C" line is pictured here. A 3 pole, 2 bladed, 2 fuse safety switch with solid neutral, 125-250 volts for grounded neutral systems, at a much lower price than the regular 3 bladed switches.

Would you like to know more about these switches? Just write us.

The most complete line of Safety and Knife Switches in the world.

**TRUMBULL-VANDERPOEL  
ELECTRIC MFG. CO.  
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Complete stocks are carried  
in eleven distributing points  
throughout the United States



# SAFETY SWITCHES



# *The Electragist*

(The National Electrical Contractor and The Electrical Contractor-Dealer)

Official Journal of the  
Association of Electragists—International

Vol. 26

JANUARY, 1927

No. 3

## Watch Your Step in 1927

**W**HAT of the new year? Will it bring an increased or diminishing volume of business? Will it be a good year or a poor one? Who knows? There are, however, certain straws

which should have some bearing on the way the wind is going to blow. And so far as electrical contractors are concerned those straws are not unfavorable.—The Editor.

**B**UILDING contracts in 1926 set up another record. In the second half of the year there was some recession, but not of sufficient amount to be alarming. In fact, there are reasons to believe that many large projects were postponed a bit in order not to produce an artificial boom and so send prices for labor and materials ballooning.

The 1927 building program will probably be somewhat less than 1926. One authority estimates that 1927 will run about 7 percent below 1926. This means at about the same level as the last half of the year. According to this authority there will be a strong effort made to curtail speculative building and for that reason some drop may be expected in the building of high class apartments, hotels, office buildings and housing developments. An increase, however, is expected in industrial building.

While it may be true that banks and insurance companies will try to curtail speculative building it must be remembered that there are other ways of financing such projects which flourish so long as there are surplus funds in the hands of the public.

Electrical contractors, therefore, are warned to be wary about accepting speculative work. They may find more opportunities to get jobs where all or part of the payment is to be made in stock or second mortgage bonds. In such cases it is advisable to increase the bid by an amount sufficient to cover the discount they would have to take provided they wanted to sell the stock or bonds.

### 1926 Money Was Easy

The year 1926 was unusual in that the volume of business done in all lines was very large, but money was exceptionally easy. It was almost impossible for the bond houses to secure bonds enough to supply the demand occasioned by the amount of uninvested surplus funds. It is hard, therefore, to see how any recession in 1927 can be very severe, for chaotic times come only when credit is frozen and money is scarce.

The year 1926 was a melon-cutting year for big business. These companies did not take the step of greatly increasing their outstanding stock on which dividends must be earned without assuring themselves that the immediate future was safe from a slump.

These big dividends were not in cash but in stock, representing undivided surpluses. The money therefore was not taken out of business, but left in for expansion. When key industries expand it means expansion all along the line—more factories.

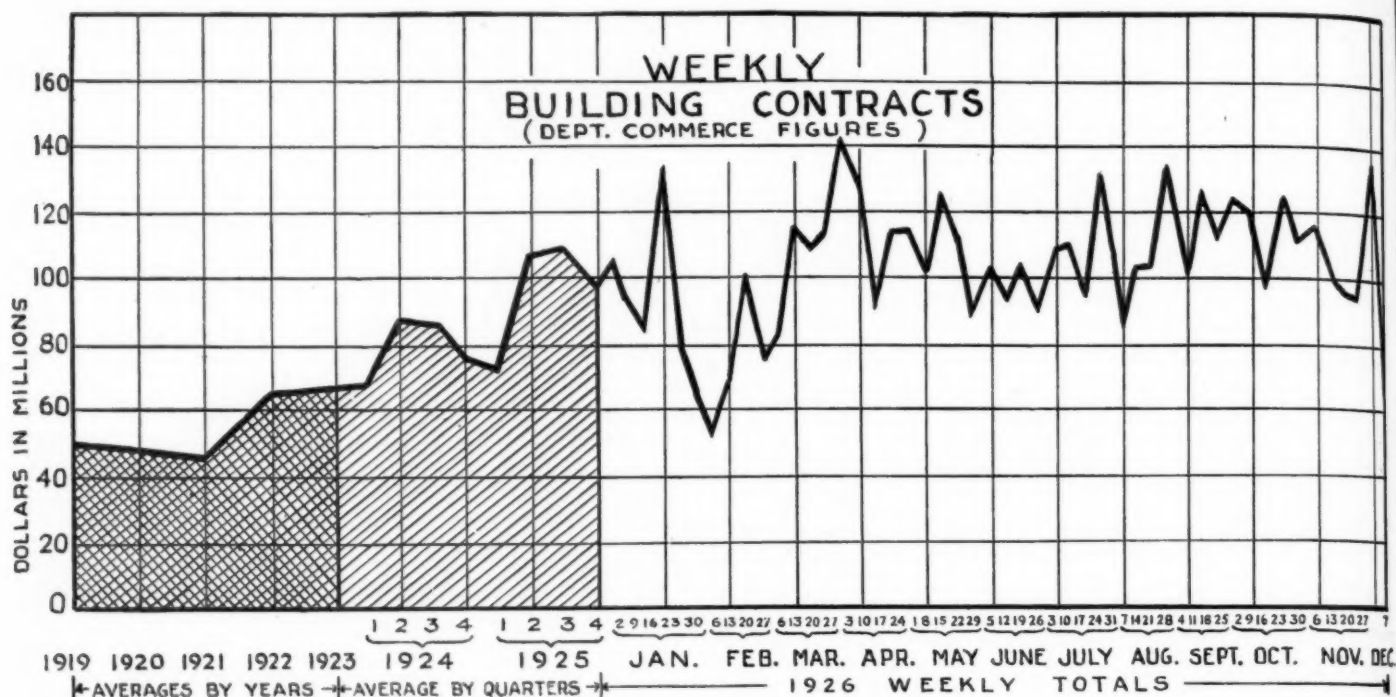
With money easy and with everyone expecting a little easing down in the first three-quarters of 1927 it would be surprising to find prices advance on wiring supplies. It is doubtful if prices will recede much because there will still be lots of business available.

Labor, of course, is always an uncertain element. It would appear at this writing as though labor would find it difficult to justify any advance during 1927. A slight drop in building volume might cause sufficient unemployment to cause more effort being put behind the five-day-a-week program.

One of the brightest spots on the 1927 horizon is the probability that the year will bring more consumer education on the value of adequate wiring. The plans now being considered may not all materialize this year, but the progress that will be made will be most encouraging.

Early in the year the first of such





efforts on rewiring will be launched and there are hopes that even larger programs may find expression before the year is over.

In a number of places central stations will start rewiring campaigns. The contractors will in all probability be asked to work with them. Every contractor should encourage rewiring. It opens up a very gold mine of a market.

The efforts by manufacturers and others to educate the public to want better wiring and the momentum that the Red Seal Plan is gathering should be of immeasurable value to contractors during the year.

There are reasons for believing that a number of central stations will recognize the economic importance of the electrical dealer in the furtherance of its load building plans and that a better spirit of trade relations will begin to develop. In fact, it begins to look as though the dealer side of a contractor's business could be made profitable.

In view of the possibility of greater unemployment it might be well for those selling wiring and appliances on time payments to reduce their line of time paper and to be more careful than ever about their time credits.

Finally it will be well not to allow accounts to stand unpaid as long as has been the practice. Collections this year will determine whether men stay in business or not. If we are to keep

the credits of the country in an unfrozen condition we must insist on prompt collection.

Thus the message for 1927 to electrical contractors is: It will be a good year—for those who are careful. Don't take too many speculative chances, watch your credits and insist on good collections.

### Legislation or Cancellation?

Editor, THE ELECTRAGIST:

There is no question but that we Americans are the greatest lawmakers in the world. We make 'em by the pound, carton and bale. But laws apparently do not stop wrongdoing.

In the electrical industry we are trying to maintain the safety of electric wiring by local ordinances, state license laws, etc., which are worded so as to prevent poor work from being done and to keep unauthorized people from doing electrical work.

But the public doesn't understand what it is all about or care to understand. If there is any punishment for breaking the law it is the contractor who receives it, not the customer.

Now if the customer in some way could be held responsible with contractors for violations then perhaps the public could be made to understand.

The public may not understand an ordinance or a license law, but it does understand the meaning of the word "cancellation" when applied to insur-

ance. When all or the greater part of one's money is tied up in a building the threatened cancellation of the fire insurance will cause him to have a complete, specific and definite understanding of what it is all about.

Electricity is safe only when properly installed. The initial installation is safe because the inspector exercises a control over such work and will not pass the job until it is right.

The real danger from electricity comes after the job is turned over to the customer. Statistics show that the greatest hazard is from the misuse of electrical appliances and the unauthorized tampering with and additions to the wiring.

If it is wrong for a contractor to violate the Code, it is equally wrong for the public to do so or to hire some one to do so. If the inspection departments are serious in wanting to reduce the electrical hazard they should exercise some control over the offending public.

When a contractor willfully violates the Code his license may be cancelled. When the public violates the Code why shouldn't its fire insurance be cancelled?

The public is quick to understand. It wouldn't take very many cancellations of insurance before the public was pretty well educated.

Less legislation—more cancellation! That the answer.

E. A. ARTZ, Past President,  
Iowa Association of Electragists.



# Installation Details in a Modern Office Building

**New Prudential Life Insurance Building at Newark, N. J., is an Excellent Example of Latest Methods of Electrical Construction for This Type of Structure**

By PAUL B. NELSON

THE electrical installation in the new fifteen-story Gibraltar building of the Prudential Insurance Company of America, recently completed at Newark, N. J., is an example of the latest methods of construction and embodies correctness in every detail. This latest addition to the Prudential group of buildings is constructed as an addition



Figure 1—Section of specially constructed pull box in basement where bank of 25 conduits changes position from side to top of passageway

sageway. The conditions at the main switchboard required an unusually large pull box and much crossing of heavy cables; the manner in which this problem was solved leaves nothing to be desired from an engineering standpoint. As the Gibraltar building is devoted to offices exclusively, outlets for 110-volt power for small motors, telephone service and low tension signal system were required at frequent intervals for desks. An all-steel underfloor duct system was installed to accommodate these leads. Construction details of these features will be described in full, later in this article.

Light and power for the entire Prudential group of buildings is generated by a private plant. The old equipment, which is located in the west building, consists of two 500-kw. generators. Equipment installed in the Academy street building to care for the increased load of the new building consists of two 1,000-kw. and one 500-kw. General Electric 3-wire d. c. generators, driven by steam turbines. Exhaust from these turbines is used for heating purposes. Leads for the light and power of the Gibraltar building feed through an 8,000-ampere circuit breaker located in an alcove a short distance from the generating room, and go through a tunnel under Halsey street to the main switchboard, situated in the basement of the new building.

Leads from the generator bus to the circuit breaker consist of seven

8-in. x 1/4-in. copper bars for the main legs and five bars of the same size for the neutral. These bars are supported every 6 ft. by blocks of ebony asbestos 2 in. thick, which are notched to receive the conductors.

Leads from the circuit breaker to the main switchboard in the new building are 25 cables, 1,000,000 c. m. in size, each contained in a 2-in. conduit. Ten cables are used in each of the outside legs and five are used for the neutral. Difficulty was encountered in placing these conduits in the narrow passageway between the two buildings, already containing a large number of water and steam pipes, necessary for a large office

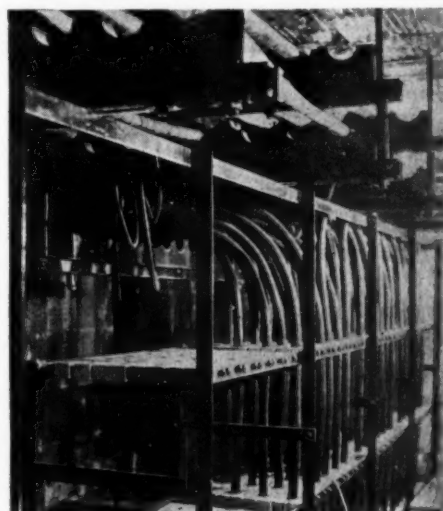


Figure 3—Details of cable supports in pull box over main switchboard in the basement

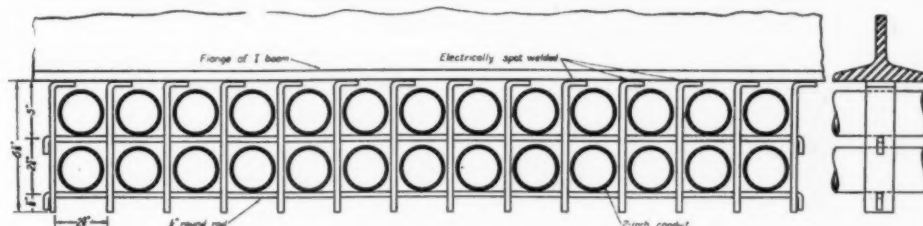


Figure 2—Rack support for conduits by means of which the bank of 26 conduits is supported next to ceiling, taking a minimum of space

to the present northwest building and the entire structure will then be known as the Gibraltar building

There are several outstanding features connected with this installation. As this new building obtains its light and power supply from a private generating plant located in one of the other buildings of the group, special construction was needed in bringing these leads to the building through a narrow pas-

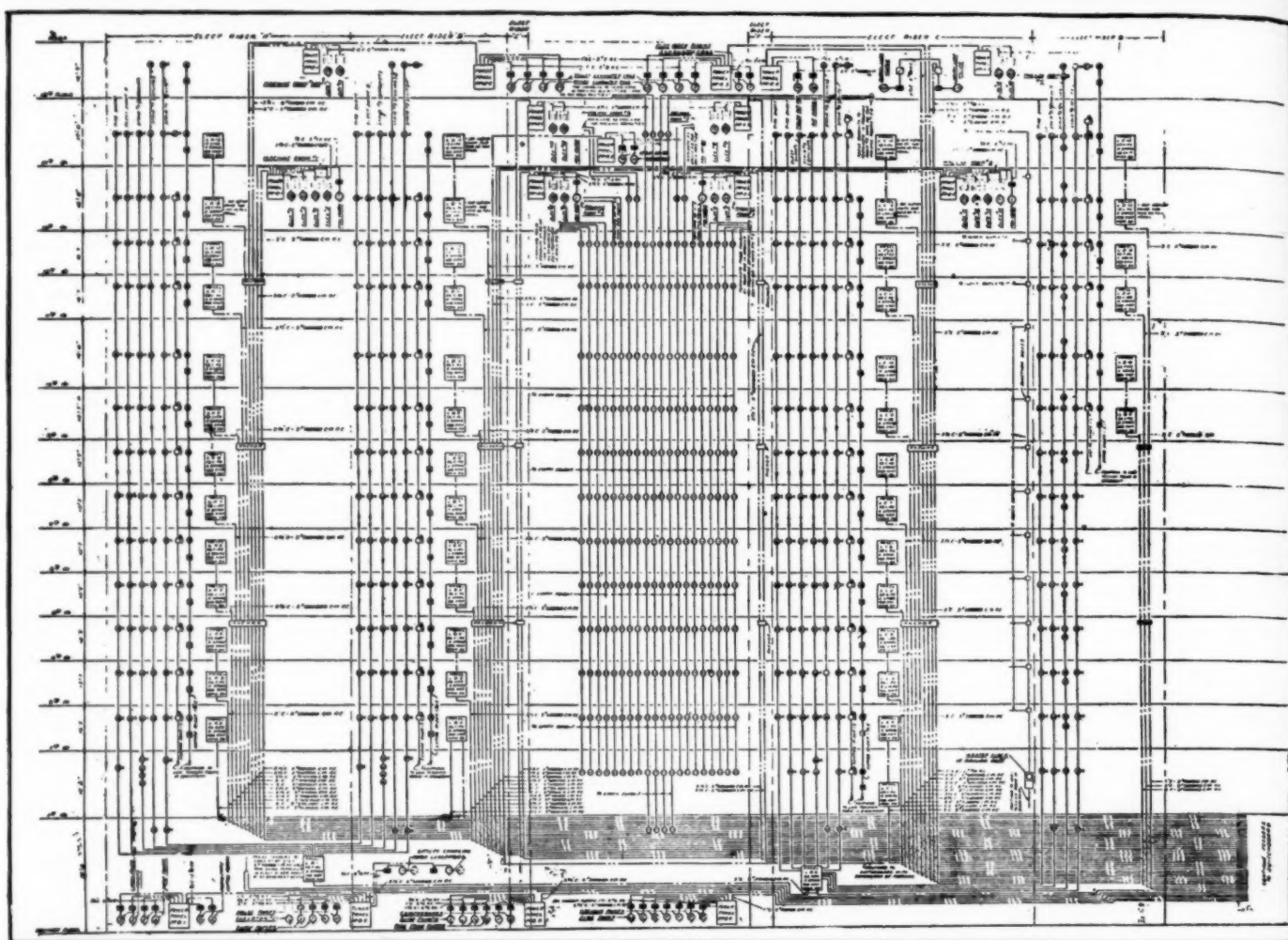


Figure 4—Riser sheet showing the entire light and power layout for the building

building. However, this was overcome by grouping the conduits in banks, and running them near either ceiling or side of tunnel as room permitted. About halfway through the tunnel the passageway narrows and at this point it was necessary to change the location of the conduits from the side of the tunnel to the ceiling. In order to make this change a special pull box, shown in figure 1, was installed. The conduits coming into this box from the circuit breaker are grouped in three rows of 9, 8, and 9, respectively, and run on the left side of the tunnel. The conduits which run from this pull box to the main switchboard are grouped in two rows of 13 pipes each. These conduits are supported every 6 ft. by a rack shown in figure 2, which is electrically spotwelded to the I-beams of the building. By this method of supporting conduits a minimum of space is required and a very workmanlike job results.

These conduits terminate in the pull box, located above the main switchboard. The cables terminate in lugs

bolted to a short run of bus bar which feeds the entire board. This bus is the same size as that which runs from the generator bus to the 8,000-amp. circuit breaker and is similarly supported by 2-in. ebony asbestos.

An extra 2-in. conduit in this run contains control wires whereby the main light and power circuit breakers, located on the main switchboard, can be controlled from the generator room in the other building.

The main switchboard, which is of General Electric manufacture, is 26 ft. 8 in. long and consists of 10 panels, each 7 ft. 6 in. high. The leads from the generating plant are connected to two main circuit breakers, each of 400 amp. capacity, one for power and one for light. Each power feeder is controlled by a circuit breaker. Lighting feeders are controlled by knife switches and protected by cartridge fuses in the outer legs, mounted on slate panels at the rear of the board. From the feeder circuit breakers, fuses and center terminals of switches, copper bars are extended to the top of the board, termi-

nating in lugs just below the bottom of the pull box.

Located on the light section of switchboard are 0-400-amp. ammeters connected through shunts in each leg of the main light bus. A 0-300-v. voltmeter is also located on the light section and is connected to a multi-throw switch so voltage across the outer buses or from either outer to neutral can be ascertained.

On the left end of power section are a 0-300-v. voltmeter connected across the two-wire 220-v. d. c. power bus and a 0-6,000-amp. ammeter connected in one leg. Both of these meters are mounted on a swinging panel. Wattmeters of the G-3 4,000 amp. type are located on both the power and light sections of board.

A pull box, running the entire length of the switchboard, 8 ft. high and 7 ft. deep, is located directly above the board. Conduits, which contain the light and power feeders for the entire building terminate in both ends and the back side of this pull box. By means of a carefully designed and constructed



system of racks the cables are carried to their respective lugs. (See figure 3.)

All horizontal runs are laid in a rack made of impregnated maple bars, notched to receive the conductor and with edges bevelled so as to prevent cutting of insulation. There are eight of these racks, spaced 30 in. apart. The bars are supported on 2-in. channels which are suspended from the floor arch above by steel rods. In each of these bars there are 12 notches for cables, spaced 5 in. center to center.

to the box at the same height as the corresponding racks. By this ingenious system of horizontal and vertical supports the cables are well supported and thoroughly insulated. Where cables cannot be well separated from one another they are wrapped with a good grade of asbestos tape, previously impregnated with a sodium silicate solution. In all smaller pull boxes in the building cables are wrapped with tape.

The entire system of racks, together with the supporting framework of the pull box, was first erected in place; the

feeder cables were then pulled in, properly placed on the racks and connected to their respective lugs. After the completion of all cable work the plates enclosing the box were bolted to the framework.

Four sets of vertical risers, A, B, C, and D, supply light and power to each floor and run in a centrally located space which in addition contains elevator shafts, stairways, pipe shafts, as well as space for laboratories on each floor. Each of these four sets of risers supplies a quarter of the adjacent floor space, which is devoted to offices. Risers B and C feed out of the right end of pull box and the conduit for riser A feeds from back of box. Riser D feeds from the left side of pull box.

The general distribution system for light and power is shown in riser sheet. (See figure 4). From this diagram it will be seen that the entire first floor is fed from a 54-circuit panelboard located in shaft A. The general plan for the remaining floors is that from the second to the seventh floors, inclusive, each floor is fed by risers in three of the shafts, while from the 8th to the 14th floors, inclusive, each floor is fed by risers in all four shafts. In every case, excepting the first floor, one riser feeds a section of two floors.

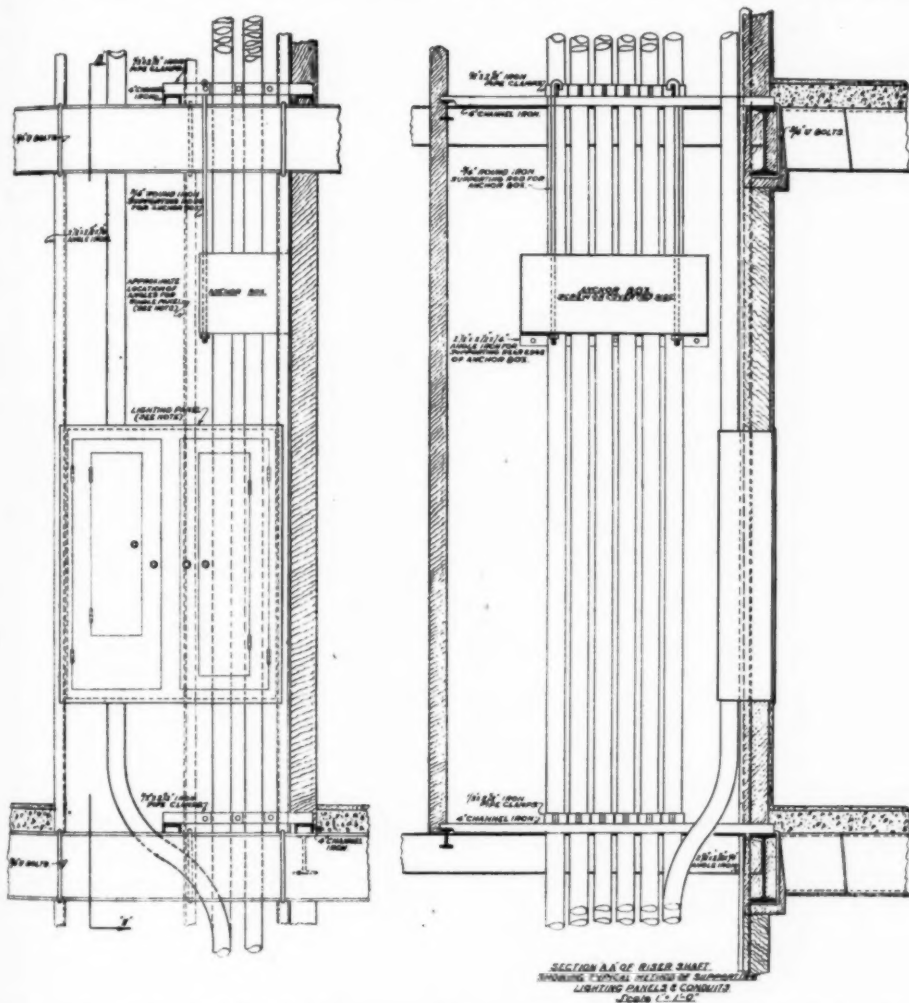
#### Power Risers

There are also two separate power risers, E and F, each of which runs to the 13th and 14th floors where they supply power to elevator motors.

Twenty  $\frac{3}{4}$ -in. conduits run to outlets on every floor for up and down elevator signals.

Beside the light and power risers, each of the four electric shaftways contain one riser consisting of two No. 14 wires in  $\frac{1}{2}$ -in. conduit for 60-watt stairway brackets, two risers of the same size for 40-watt lights in pipe and elevator shafts, one riser consisting of four No. 14 wires in  $\frac{3}{4}$ -in. conduit for stair ceiling lights on each floor, one similar riser for elevator, one riser for the clock system which terminates on every floor up to the 13th and is enclosed in 1-in. conduit, and one  $1\frac{1}{4}$ -in. riser for fire alarm, making outlet at each floor.

The various risers described above, in shaftways A and B, feed from a 32-circuit panelboard in basement. These risers in shafts C and D also are fed from another 32-circuit panelboard in the basement.



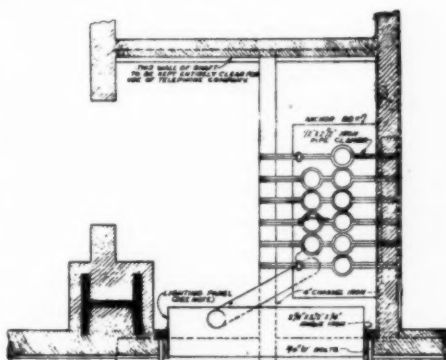
Figures 5 and 6—Details of cable support box. These are placed at intervals in wire shafts to support feeder cables for light and power

The bars are 52 in. long and 2 in. x 4 in. in cross section.

All vertical cables in this pull box are supported by means of No. 4 one-wire National porcelain cleats, bolted to  $1\frac{1}{2}$ -in. angles.

In the bottom of the pull box there are sections of 1-in. ebony asbestos containing holes through which the cables pass from the above described racks to make connections to the board.

The various conduits make entrance





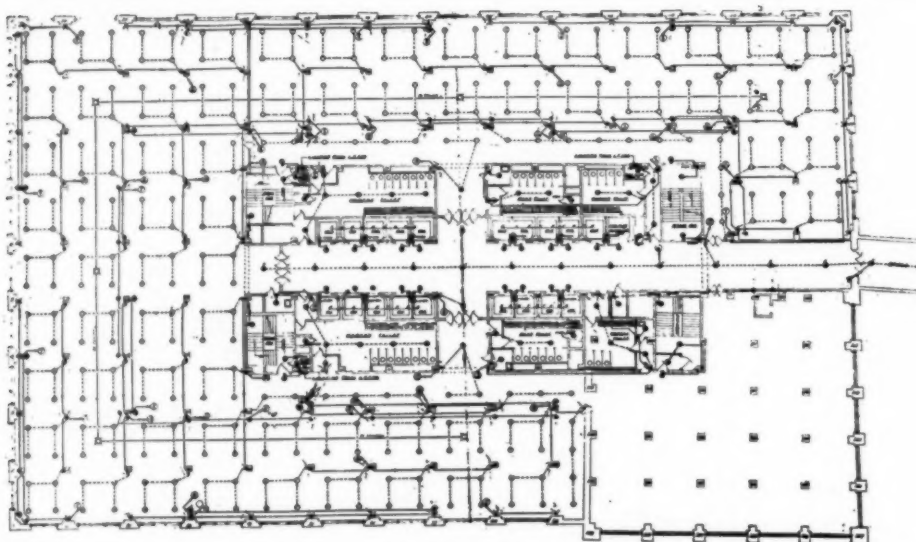


Figure 7—According to this typical lighting plan, bays, which contain 360 sq. ft. of floor space, have four ceiling outlets of 150 watts each

There are cable support boxes at floors 3, 6, 9, 12, and 14 in each of the riser shafts. (See figures 5 and 6). In addition to these, cable supports are used in the cabinets containing lighting panelboards wherever necessary. Solderless clamp connections are used for connections from riser cables to these

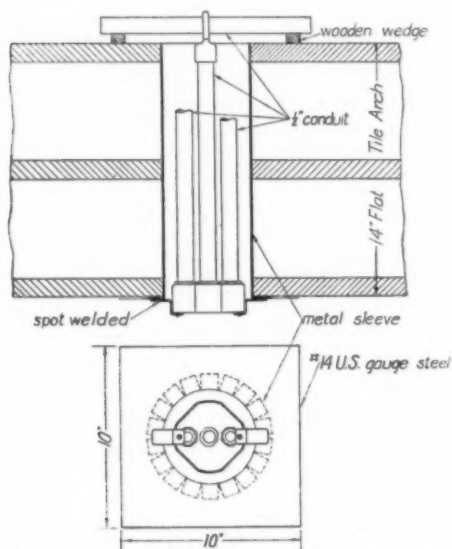


Figure 8—Sleeve installed in arch and jig for ceiling outlet box

panelboards as, by their use, a neater and more efficient job resulted.

Lighting panelboards are of General Electric manufacture and of the safety type. They were designed for plug fuses and have toggle switches. These panelboards supply, in addition to the ceiling lights, receptacles located on the various columns, vacuum cleaner outlets on outside walls, and 110-volt power for the underfloor duct system.

A typical illumination floor plan is shown in figure 7. There are 350 ceiling outlets on a typical floor of 150 watts each, making a total of 52,500 watts per floor. In general, there are four ceiling outlets per bay, all controlled by one switch. A typical bay has an area of 360 sq. ft.; therefore the standard allowance per square foot for the overhead lighting is 1.67 watts. There are eight outlets per circuit. All wall switches are double pole. Wire nuts were used throughout for making fixture connections and splices in outlet boxes, as it was found that they effected much labor saving and made a much neater and efficient job.

As a matter of refinement, bakelite switch and receptacle plates were used, secured by screws having caps of the same material. The switches, which are of the toggle type, have luminous buttons set into the operating levers.

All-steel underfloor duct system is used on every floor except the first, fourteenth and fifteenth, and provides 110-volt power for small motors, telephone and low tension service to wherever desired. This system, which was described in detail in the August, 1925, issue of *THE ELECTRAGIST*, makes use of an all-steel duct, 1 1/2 in. x 1 1/2 in. in cross section, made of No. 14 U. S. gauge steel and furnished in 10-ft. lengths. The body of the junction box is 5-in. square and has two openings, since in this installation a two-duct system was used. These openings for duct occur on two opposite sides, while on the other two sides are threaded openings for conduit. Conduit is used for interconnections between the various

runs and as feeders from the low tension service boxes and from lighting panelboards.

It is sometimes necessary to sink the box into the finished slab so as to make it come flush, but this was unnecessary in this building, as there was a space of 5 in. from top of tile arch to the finished floor.

The duct layout for this building is interesting, the outside duct line running near the exterior of the three sides of the building at a distance of 5 ft. from the wall. The second line is spaced 20 ft. from the first, while the third duct line which occurs only at one end of the building is at a distance of 16 ft. from the second line.

Power at 110 volts is supplied to this underfloor system by means of No. 14 duplex wire run in 3/4-in conduit from the nearest lighting panelboards. Lighting circuits occupy one duct, while the

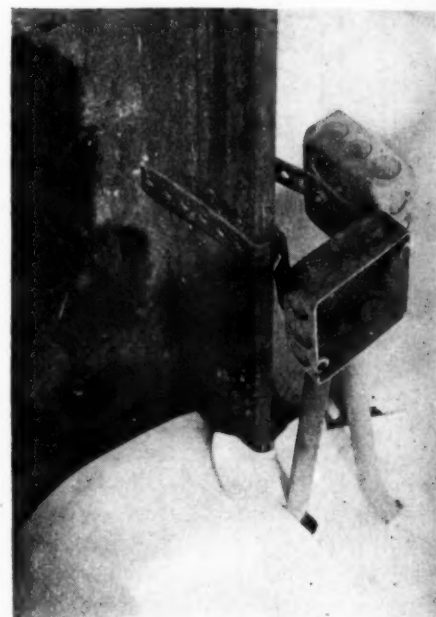


Figure 9—Method of supporting outlet boxes on steel columns

other is taken up with the telephone circuits fed from service boxes in 1-in. conduit.

Preset inserts occur every 30 in. and thus allow for the convenient insertion of standpipes wherever desired. A furniture plan was drawn up of the arrangement of desks and other office equipment and from this was determined the locations for both the power and low tension outlets. The circular brass junction box covers, which fit flush with floor, are covered with disks of linoleum

(Continued on Page 33)

# Accident Prevention Methods for the Electrical Contractor

*Safety Problems in Electrical Construction Are Peculiar to That Field But There Are Ways of Solving Them and Saving the Employer's Money and the Employee's Life*

By M. S. MacNAUGHT, Vice President,  
Barnes-Pope Company, Boston

**E**LECTRAGISTS, in adopting accident prevention methods, must recognize the fact that their problem has to do with some rather intangible hazards, as compared with the situation in factories, where ingenious guards can largely eliminate the dangers of machinery. The electrician working high up on a new building is exposed to a formidable variety of dangers, some resulting from his own careless conduct, while others, such as falls, the hazard of objects dropped from above him, strains, bruises, electrocution and kindred classifications are quite largely beyond his control.

The proper combat of these diversified risks is founded not so much upon specific mechanical guards against each individual danger as it is upon the repeated teaching of a few fundamental safety principles, the most important of which is everlasting caution. So far as possible this article will present the main sources of accidents, with an outline of preventives, but the individual contractor must in every case be prepared to adapt general methods to the special hazards facing him.

## Foreseeing Danger

Probably the man best qualified to effectively reduce the accident rate of a particular company is the superintendent. Such an official properly convinced of the value of a perpetual accident prevention campaign is sure to soon learn how to combat the ordinary hazards, and experience will develop the ability to foresee dangerous conditions before they reach a point endangering his men. In this work the superintendent can receive valuable aid and training from a safety engineer supplied by the insurance company.

As a matter of fact, contractors as a group are not getting the attention they deserve from liability companies, due largely to their neglect to ask for real

service, and unwillingness to cooperate to the full. Factories, large and small, are visited frequently by safety engineers from the insurance company concerned, and every effort is made to devise guards for dangerous machines, eliminate any troublesome moral or psychological risks, and properly apply first aid, with the result that these inspections make possible a steady decrease in accident rates.

But mention an average contracting business to an insurance man and he promptly acknowledges that he considers the hazard as too vague and varied to be easily combatted.

The fact remains, however, that the contractor who really means business can have a safety engineer sent by his insurance company to his office, or out on his jobs, to discuss and demonstrate safety methods.

## Instructing Superintendents

Such a skilled safety engineer is qualified to instruct superintendents in the most approved methods of prevention—and he is available to every contractor with elementary brains enough to demand of his insurance company a service to which he is certainly entitled.

But how to accomplish all this? Let us first determine what classes of accidents most seriously affect the industry. No better tabulation of the accidents assailing the electrical construction industry has been published than that in the January issue of THE ELECTRAGIST, which is reprinted here.

Falling from ladders, scaffolds, etc.,	10%
Feet injured from stepping on nails	10
Injuries from handling wire, conduit, etc.,	10
Injuries from using hammers	9
Eyes injured while drilling steel	9
Objects falling from above, such as brick	7
Sprains of back and shoulder, etc.,	7
Cutting fingers and hands on knives, drills, etc.,	7
Slipping and tripping on floor	5
Letting motor, pipes and other heavy material fall on feet	5

Injuries from testing motors, etc., and from short circuits	4
Eyes injured while cutting concrete	3
Mashing fingers and hands on objects being handled	3
Eyes injured from filing and threading pipe, etc.	2
Fingers injured with screw driver	2
Eyes injured in using emery wheels	1
Eyes injured in using solder	1
Injuries from falling down elevator shafts and joint ways	1
Fingers injured from slipping wrench	1
Bumping and walking into stationary objects	1
Drills breaking	1
Injured by fellow workmen	1

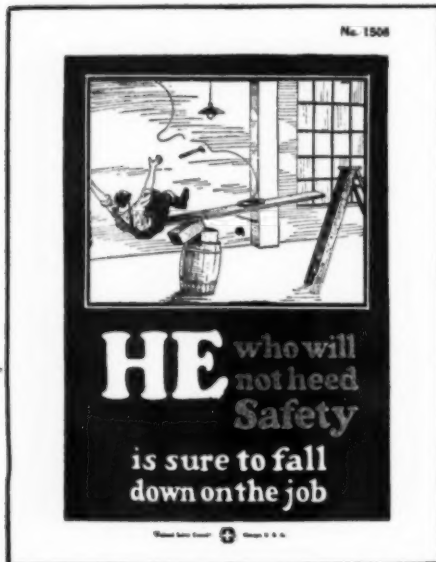
Reference to this list shows as a primary source of danger, falls from ladders, scaffolds, etc. Many of these accidents are due, no doubt, to the sheer carelessness of the average human being, for of course there is no available guard against falling, other than caution.

Contributory causes of these accidents, however, are within the control of either the workmen or the employer. First of all, frail, patched, unsteady ladders or horses have a measure of responsibility. The employer must accept the blame for the use of inadequate ladders and horses, and it is he who must remove the fault. However, the workmen can help by calling to the attention of the superintendent any defective equipment.

In order to be classed as a really good step ladder for use on construction, a ladder should meet the following requirements when sent from the shop:

1. It should be wider at the bottom than at the top, so that a man working on the highest step cannot easily shift his center of gravity outside the base.
2. It should have thick, solid sides, instead of light latticed framing.
3. It should have steps made of heavy timber, securely bolted to the sides, with iron braces underneath.
4. Under no circumstances should any steps be missing.





Falls from ladders and scaffolds, etc., account for 10 percent of the accidents in the industry

5. It should be equipped with an effective brace or other device for holding it rigidly in the open position.
6. Its back should be solidly cross braced.

There is one source of falls to which electricians should not ordinarily be exposed. That is, they should not be required to work on the naked steel of buildings. Foremen, in their eagerness to make all possible progress on a job, sometimes push the installation of riser conduits, cabinet boxes and similar material ahead of the floor construction. This means walking narrow girders several stories above the ground or other finished floors. Usually little is gained by pushing the conduit installation so far ahead of the rest of the work, and it does needlessly expose men to dangerous falls.

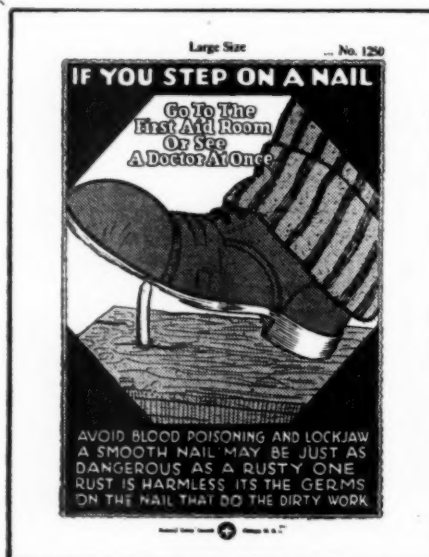
One of the most exasperating causes of accidents, and perhaps the hardest to really eliminate, is the ugly little up-turned nail with its mute threat of blood poisoning. Left with its point exposed, any nail is a constant source of danger; clinched down, removed or otherwise protected, it is unable to carry out its role as a major accident cause.

The simple operation of turning over a board with protruding nails, or removing or hammering them over wherever they are found in any unguarded place completely eliminates the possibility of an accident. A very easy thing to do, yet the nail still accounts for about ten percent of our industrial accidents!

At least so far as employers are concerned there should be no hesitation in forcefully instructing workers to eliminate every protruding nail they see—and as an additional precaution every man should be required to wear shoes with heavy soles.

Accidents incurred while handling conduit and wire are in general rather difficult to guard against, for the personal element enters very largely into the problem. To a certain extent,

**These posters, supplied by the National Safety Council, portray vividly six of the commonest hazards in the electrical construction industry**



Another 10 percent results from stepping on nails

though, poor or inadequate tools can be blamed for a share of the slaughter.

As an example of this, a workman while bending conduit with a defective hickey pulled the handle from the tee, fell, and in doing so struck his leg against the end of the handle, causing an ugly wound. In addition, he was thrown into such an awkward position that he suffered a severe strain of the back. His medical attention and compensation costs, indirectly increasing the individual insurance rate, have cost his employer many times the price of a good substantial hickey. Cheap home-made tools are sometimes expensive.

Bending of conduit in a properly constructed bending machine, or with suitable tools, should be insisted upon by superintendent, not only to eliminate

the accident caused by makeshift methods, but to promote efficiency. It is a simple matter to bend even large pipe to measure in a good machine, but if workmen are forced to adopt crude, antiquated methods for making bends and offsets, they inevitably waste time, produce sloppy results, and invite strains as well as other forms of accidental disability.

Injuries from the handling of wire are not of such great importance, and they are difficult to guard against. The best precaution for every workman to adopt consists plainly and simply of good gloves worn whenever pulling in or otherwise using wire or cable. Then, too, snakes should be handled carefully, for continual rubbing against conduit sometimes hones the edge of the tape to a razor edge which can inflict a deep cut; and the eyes may be hurt if the end of a snake is carelessly snapped around.

The danger of meeting with an accident while using hammer and drill exists principally because stock clerks or others responsible for sending tools out to jobs do not take the precaution of grinding drill heads flat. In use, drills are certain to have their heads rounded and burred by constant hammering, and, naturally, a blow struck on a curved surface is quite likely to glance off, with resultant smashing of fingers, hand or wrist. Hammers with flat striking surfaces, plus drills with properly flattened heads are vital.

Of course, inaccuracy and carelessness play important parts in causing such accidents, for all too often a man



Handling wire and conduit is responsible for 10 percent



fails entirely to strike the drill, landing a nice hard blow on his hand instead. But that, unfortunately, is something an employer cannot very well counteract, unless he undertakes to provide his men with armor for their hands.

Eye injuries, affecting as they do a vitally important part of the workman's body, cause untold suffering, loss of time, and vast social trouble. Yet they are easily preventable. And because they are practically needless, every employer who fails to provide protection, and every workman who labors without first guarding his eyes is guilty of a real crime against society.

The protector is nothing more mysterious than a pair of goggles, worn during every operation involving an element of danger to the eyes. A good pair of goggles, with heavy lenses, and protective side pieces, costs less than one dollar, and could profitably be placed in the tool bag of every workman, free of charge.

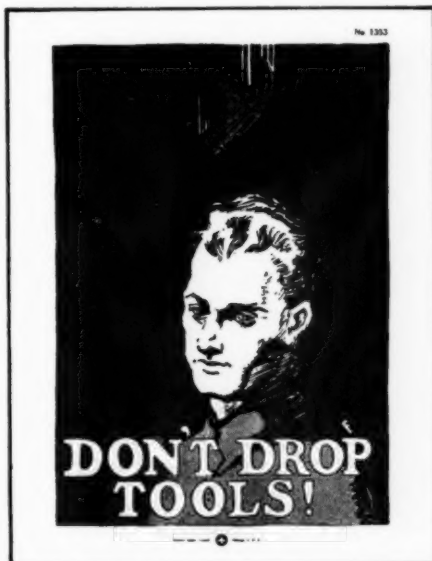
It is positive folly to chop terra cotta, drill concrete, work over emery wheels or on metal without some eye protection, yet in practically every case electricians scorn the use of goggles.

Insurance records show that approximately sixteen percent of the electrical industry's accidents are classed as eye injuries. Interpreted into dollars and cents, if every contractor eliminated eye accidents, insurance rates would be reduced accordingly, and each electragist would save about one-sixth of his present tribute to insurance companies. Well worth a few dollars spent on goggles.

One of the most significant axioms

to be learned by every building trades employee is that the men working high up on a building are invariably careless about what they drop upon those below. Faced with this condition, it behooves electricians to take the precaution of finding out whether riveters or others are working up above, with the idea of carefully avoiding those spots where tools, rivets, brick, terra cotta, planks and other debris might be expected to fall. A hot rivet, dropping

**Only by continual use of such educational means as these posters can the contractor reduce his accident list and cut his insurance rate**

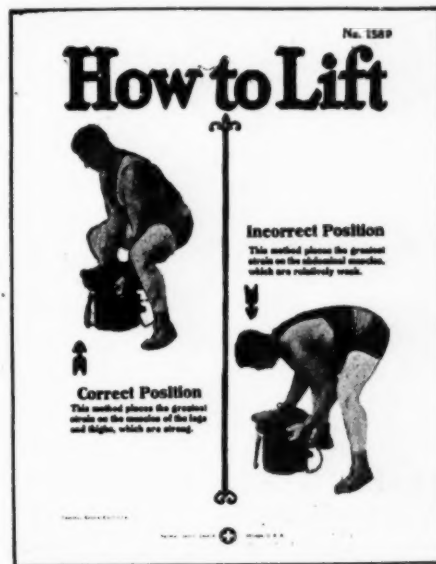


Objects dropped from above are responsible for 7 percent

ten stories, may inflict a bad bruise if nothing more, while a plank coming the same distance inevitably breaks the skull or shoulder of any unfortunate workman it strikes.

Incidentally, every worker should wear some substantial head covering, either a cap, soft hat, or best of all, a stiff straw. Such a head piece breaks the force of the fall of small objects, and thereby saves many a bruise or cut. If construction conditions do not improve workers may yet be obliged to adopt the cast-off "tin derbies" of the late war.

The problem presented by sprains and strains could, perhaps, be partially solved, if the job foremen would assign adequate crews to heavy jobs. The moving of generators, transformers and



Sprains from lifting total 7 percent of all injuries

similar apparatus, as well as the bending of large conduit, frequently requires the effort of several men, but the short sighted foreman is very likely to use too few workers. Nothing is gained in efficiency, for the fewer men simply take a longer time, and in addition face the danger of injury.

In the more intimate handling of electrical circuits, with the exception of high tension and pole line work, the electrician who knows his trade should avoid accident.

The handling of live circuits first calls for care that the voltage is definitely known, with the adoption of suitable precautions. By and large, however, it is not necessary for electricians to handle live wiring. If working on a branch circuit, the fuses or switches should invariably be pulled, and the same applies to mains. Before touching live parts of main switchboard the service switch should be pulled.

The hazard involved in splicing live mains, or even branch circuits is very real. For instance a short circuit on a main backed by sixty ampere fuses is practically certain to pull an arc which is likely to cause:

1. Severe arc burns of skin of hands, face, etc.
2. Severe retinal burns.
3. Severe burns from flying molten metal.

The man who solders such a main alive is courting a brilliant flash, with the probability of finding an instant later that the skin of his hands is nicely charred to a crisp black. That means

(Continued on Page 38)



Nine percent comes from using hammers

# The Truth About the Cost of Wiring

## This Study Shows That the Cost of Wiring Is Now Lower Than in 1914 in Relation to Living and Building Costs

By S. B. WILLIAMS, Editor The Electragist

**W**HAT is the cost of wiring? Is it too high or is it too low?

These are important questions, for upon their answer hangs much of the future development in wiring. If wiring costs have increased to the point where they are out of line the entire industry will suffer.

In discussing and analyzing the cost of wiring it is necessary to select some base or bases for the purpose of comparison. To argue that wiring is or is not expensive without relation to anything else is fruitless.

There is no denying the fact that wiring generally costs more in dollars and cents than it did before the war. But what doesn't?

Is it fair, however, to make statements regarding expensiveness with only the money value to go by? The purchasing power of the American dollar is not what it was in 1914; nor is there any indication that it is liable to be in the nearby future. One must then take the purchasing power of the dollar into account before indicting any commodity on the grounds of "costing too much."

Therefore, in analyzing the cost of wiring we shall use certain well known cost factors as guides for comparison.

The cost of wiring is made up of three factors: (1) Labor, (2) materials, (3) contractor's overhead and profit.

Our present study will take up the first two factors only.

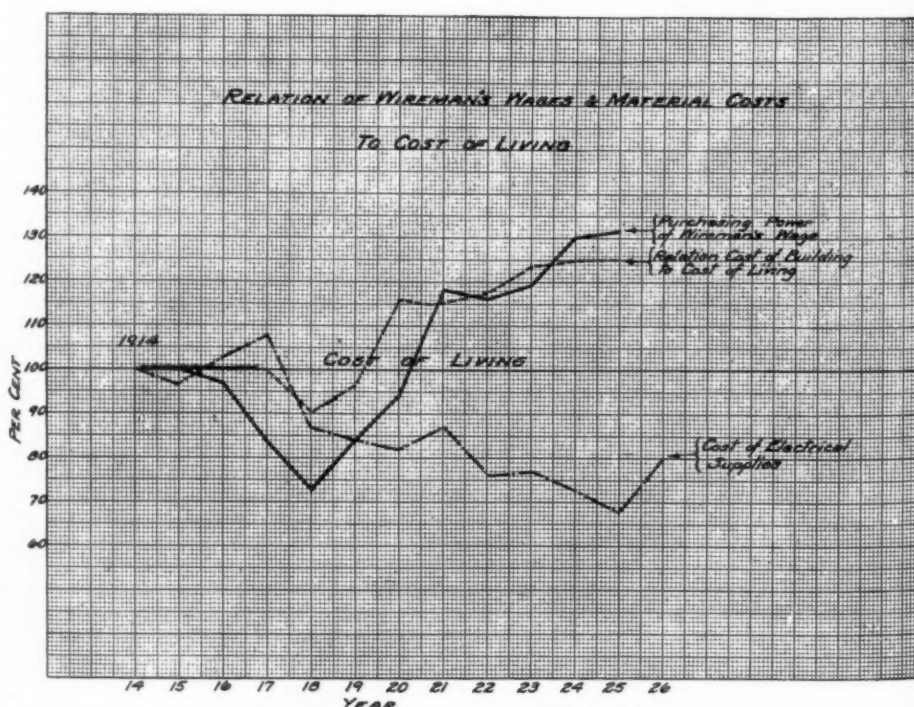
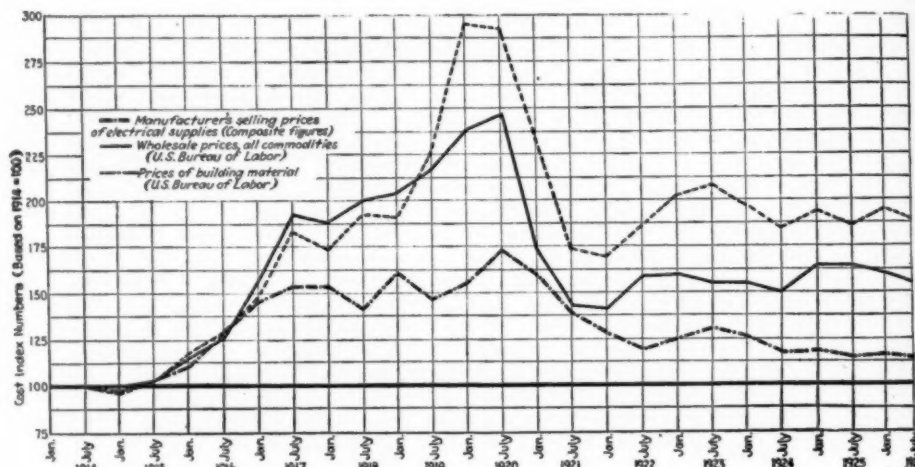
In discussing labor it will be necessary to confine the remarks largely to wage data, because of the lack of definite information regarding efficiency and labor management. There is little doubt but that the efficiency of wiremen is less than it was, say in 1914. On the other hand, there is reason to believe that the peak of inefficiency was

reached a few years ago and that now efficiency is improving.

Accompanying diagrams show how inside wiremen's wages have advanced, what their relation is to the cost of living and how the advance compares with

the average advance in wages of all building labor. The figures are all taken from official reports of the United States Department of Labor.

The wages are the average for union journeymen wiremen in thirty-seven





principal cities in the United States. The 1913 average was taken as 100 percent and the average for all other years related thereto. Open shop wages, while on the average from ten to twenty-five cents an hour below the union scale, almost always keep pace with the union scale. In many cities the two are identical.

It will be noticed that for some time the cost of living advanced faster than wages. During those years labor was actually being paid less in that its wages purchased less and less. More

recently the reverse is true, and labor is able to buy more and more with its wages.

Such a condition is becoming true in almost all classes of wage earners. If it does not go too far this is not an unhealthy condition. On the contrary, it is most healthy for a nation with such a capacity for production, in that it puts the great majority of the families of the country on a basis where they can for the first time afford such luxuries as electric comforts. A wage scale that is merely a "living wage" will not

permit any great growth in domestic consumption of energy. One might cite any of the European nations, where the cost of wiring is exceedingly small, but the consumption per family is smaller still because the family income is but a "living wage."

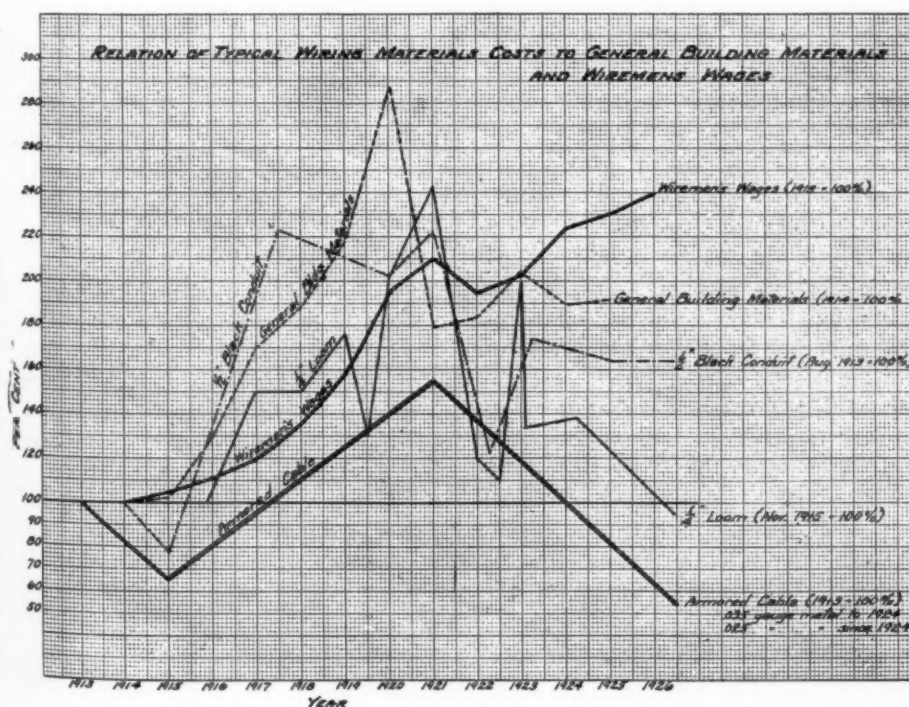
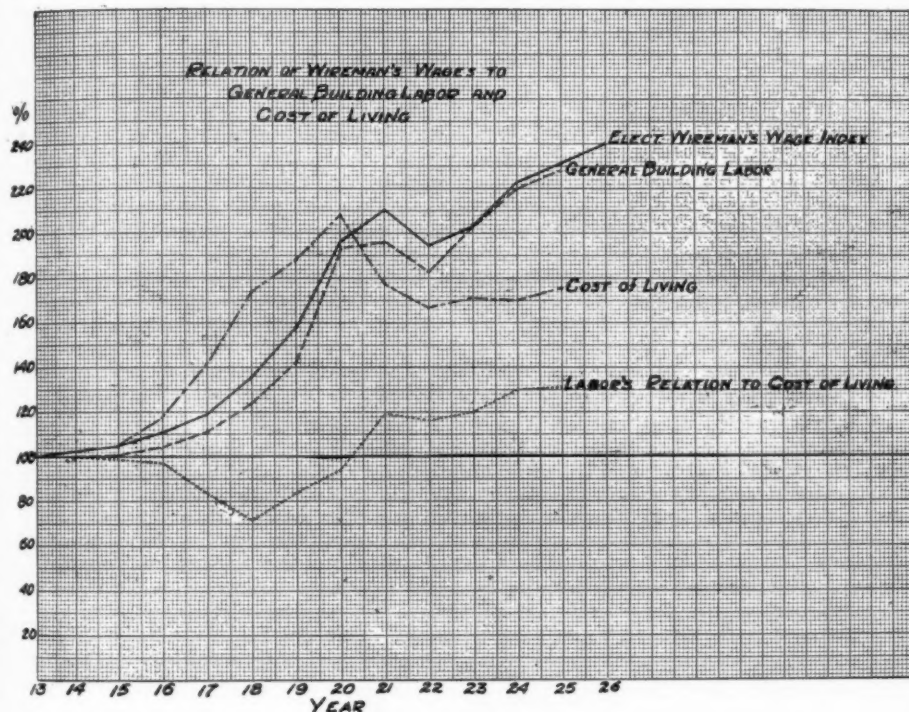
The trend of wiremen's wages, it will be noticed from the diagram, closely follows the curve for the average wage in the building trades. While slightly above the average it is still a long way from the peak wages demanded by such trades as bricklayers, plasterers.

In studying these curves it must be remembered that the electrical construction industry is way ahead of almost every other branch of building industry in the matter of relations between employing contractors and the union. For three years and over there has not been a serious strike of electrical workers in the United States, due to the efforts of the Council on Industrial Relations for the Electrical Construction industry which is composed of five representatives of the International Brotherhood of Electrical Workers and a like number from the Union Shop Section of the Association of Electragists, International.

#### Freedom from Strikes

It should not be difficult for the other branches of the industry to visualize what their losses might have been had the same number of strikes occurred during the past four years that used to happen with such regularity. The manufacturer and the jobber cannot do business or secure payment for goods already shipped if there is a strike of wiremen. Moreover, such a strike might easily, if drawn out, throw a number of contractors into bankruptcy with the attendant loss to creditors. If construction is held up by a strike it means that just so long has the utility to wait before the building or buildings are placed on the company's lines.

The sooner the contractors build up the craftsmanship and quality of the mechanical forces the sooner will labor efficiency increase. There are numerous efforts being made to accomplish this purpose, the broadest being the apprenticeship plan. Under this plan there is no "helper" class, but a young man has to go through four years of apprenticeship training in the shop, on the job and at school before he can become a journeyman. Much of the poor workmanship is due to the hit and miss





"helper" method of training men. If the mechanic were a good conscientious man he might give his helper a good training; but if he were inclined to be lazy and shiftless his helper didn't learn much about the trade.

It is growing more possible to reduce the labor content of a wiring job by better labor management, by better handling of supplies, by better employee relationship, by the greater use of labor saving tools and devices. This is a step that is more and more occupying the attention of contractors. This, however, is something which must come about gradually because the matter of efficiency is a new idea to the building trade in general. Such ideas are born of necessity and so long as the building program shows little or no likelihood of greatly diminishing this necessity does not seem to the individual to be so acute.

#### Materials

Another diagram shows the trend of material costs since the pre-war period. As nearly as possible the figures for 1914 were taken as a basis of 100 percent, although the source of these statistics made necessary adopting 1913 or 1915 as a starting point for certain items.

This diagram clearly indicates the relationship between general building material costs, several wiring materials costs and the cost of inside wiremen's wages.

Since many of the materials of wiring installations, such as copper wire, boxes, supports, panels and all finishing materials are common alike to all types of wiring methods, one characteristic material for each of three types of wiring was selected and traced through the price fluctuations for the twelve years as an index to wiring materials prices— $\frac{1}{2}$  in. black conduit,  $\frac{1}{4}$  in. loom and No. 14 wire armored cable.

It will be noted that the high point in materials costs was reached in 1920, and that since then there has been a continued lowering of the costs of materials. This is especially true of wiring materials, as compared with general building materials, and in the case of armored cable the cost of that material is 65 percent below its 1913 price level, due partly to change in gauge of metal used and largely to greatly increased quantity production and improved methods of manufacture growing out of its widening use.

It is interesting to note that both armored cable and loom are today below their pre-war costs. Certainly then any increase in the cost of wiring in "armored cable" or "knob and tube" has not grown out of increased costs of such materials.

It is therefore strikingly manifest from this diagram that the cost of labor (wiremen's wages) is a dominating factor in wiring costs. Since 1914 wiremen's wages have steadily climbed until today they are 140 percent above 1914 level, yet as shown previously these wages are not out of line with wages paid to other trades or the cost of living.

It can be readily seen, then, that the wiring methods requiring the lesser amount of labor for installation uses the lesser amount of the highest cost factor in wiring today, since labor is at its highest point both in actual wages and in its relation to all other building costs.

Wiring materials, on the other hand, are below the ratio of other general building materials, and in certain materials are below pre-war levels.

Another diagram shows the trend of the cost of electrical materials since 1914 as compiled by *Electrical World*. It will be seen that since 1916 the cost of electrical supplies has always been below the composite price of all commodities and considerably below the composite price of building supplies. The commodities selected by *Electrical World* include a number of things not classed as wiring supplies. Were these to be eliminated the difference just noted would be even more marked.

The price of electrical wiring supplies today is less than the price before the war while building supplies are almost 90 percent higher than before the war. And yet we are talking about cheaper wiring supplies!

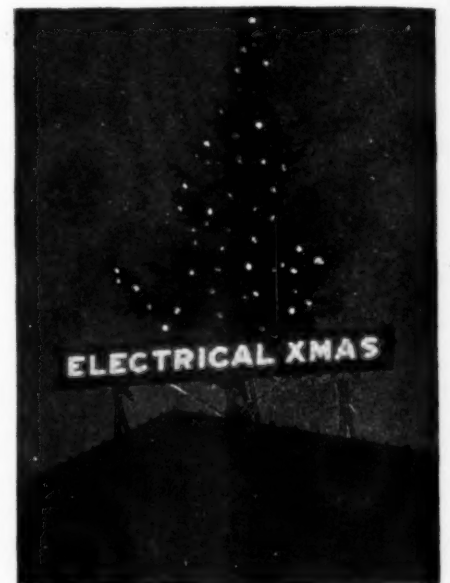
In comparison with the cost of living, it is apparent from the data presented that the cost of wiring (labor and materials) is little if any higher than before the war, while in comparison with building costs on the whole it is much lower.

However, the public has been responsible for the increased building costs in the demand for better homes. If the public insists on spending more for brass piping, better heating, hardware, woodwork, etc., who can justify the position that wiring is expensive?

The only people that believe that wiring is expensive are the people who are closest to it. The people who buy wiring have no such notion.

The same thing that has caused the public to buy more and better painting, more and better plumbing, more and better heating will cause the public to buy more and better wiring—Education.

### Canton Association Gives Public Yule Tree



Above is shown the Christmas Tree which was the 1926 Christmas offering to the public of the Canton (Ohio) Electrical Contractors and Dealers' Association. It was placed on the cornice of a two-story building in the center of the shopping district and helped considerably to promote the "Electrical Christmas" idea.

### Denverite Builds Smallest Electric Fixture in World

What is believed to be the smallest lighting fixture in the world has been built by Gerald H. Kaffer, a Denver electragist. The fixture, which uses miniature electric globes and consumes electric current just as other fixtures, is two and a quarter inches across and weighs six ounces. An idea of its size may be gained from the fact that the ordinary dining room fixture is twenty-two times as heavy and as big as Kaffer's miniature.

Lamps used in the fixture are seven thirty-seconds of an inch in diameter.

# The Case for The Ceiling Fixture

## 1. Why It Is Needed

## 2. Why It Lost Favor

## 3. How to Bring It Back

By A. L. POWELL

Manager, Engineering Dept., Edison Lamp Works of G. E.

**T**O PARAPHRASE Hamlet: "To have or not to have—that's the question."

Looking at the problem from the standpoint of quite a few years observation and thought on the subject, the writer unhesitatingly and emphatically answers—Yes.

It is quite true that for some time interior decorators, architects and others have been striving to turn the public away from ceiling lighting in the home. Many persons now building houses are refusing to install central outlets in living, dining, and bed rooms saying "It's not the style nowadays."

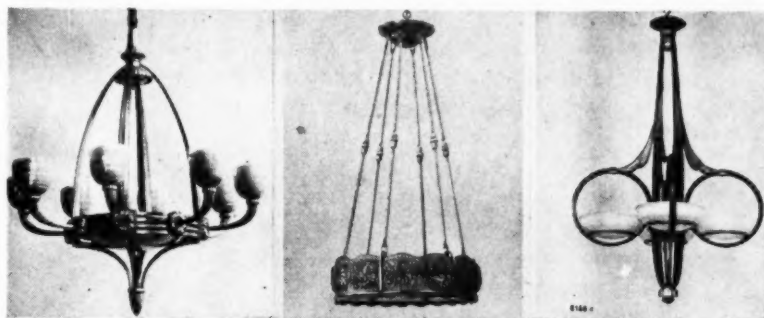
True, it is not the style at the present moment among many who give the matter but casual thought, yet there are many reasons in favor of general lighting. These reasons are so good and logical that the writer believes this so-called style is only a passing fad or fancy. A person makes a mistake in not installing the center outlet even though he does not use it at the present moment, but covers it with a neat cap. If he does not put the outlet in upon wiring the house he will regret it at some later date. Let us see first why ceiling lighting is desirable particularly in the living room, around which the greatest controversy hangs.

The living room in the modern home more than ever before serves a multiplicity of uses. A generation ago we had the parlor or salon, the library, the music room and possibly the smoking room or lounge. Now, due to changes in our habits, living conditions, inability to obtain servants at a reasonable

figure, this one room has to perform the functions formerly split up among several rooms. This condition is getting even more complicated, for in the newest type of small apartment the living room is also the dining room.

If one room now takes the place of several, how much more complicated its lighting becomes. How much more

area so that we can read in ease. Such an effect is produced through the use of a few well placed table and floor lamps fed from convenience outlets. These are not the decorative type discussed in the preceding paragraph, but good practical lamps. They will usually provide enough light to give the general illumination mentioned.



A few French luminaires embodying the semi-indirect principle which are indeed novel and give a hint of the wide variety of treatment which may be obtained

rather than less thought should we give to its analysis. At the very outset everyone will agree that the parlor or salon makes quite different demands on lighting than the music room or library.

When we are listening to music, radio, phonograph, piano or vocal we are more at ease, more comfortable and better contented with a very low intensity of general lighting. Merely a few spots of color, a few touches of high light in the room, purely decorative portable lamps, light ornaments fed from baseboard convenience outlets or a few brackets of very low brilliancy furnish the sort of lighting really needed.

Now suppose we want to use the room as a library. We need merely a moderate intensity of general lighting to prevent too severe contrasts between our page and the surroundings, but we do want a high intensity over a limited

Next we decide to stage a dance, card party or other function of this nature. Here is where we are handicapped without some means of providing a moderately high intensity of general lighting. Then is when we need the ceiling outlet. True we may not need it very often, but when we do need it if we do not have it the party is not the success that it might have been. There must be plenty of light for the festive spirit.

Portable lamps of the ordinary type will not give such lighting and besides they are always in the way at a dance. At a bridge party—Heaven forbid—there are at least two out of every four hands in almost complete darkness. Incidentally every one knows that the term "bridge lamp" has nothing to do with its ability to light a card table; the term merely refers to the sort of cantilever construction holding up the shade and socket.

Without a ceiling fixture another means of getting some light in the room is from brackets, but these are placed low in the direct field of view. If we put enough wattage in them to get a desirable intensity of illumination they become so bright as to be unbearable. At best brackets are merely bits of light decoration.



The only practical way of obtaining good general lighting without ceiling fixtures is by the utilization of *Indirect table and floor lamps*. Considering the number of homes now without ceiling outlets and the necessity for general lighting at times there exists a remarkable field for the sale of such units.

One must keep in mind that the natural direction of light is from overhead and that there is no sense in trying to get good lighting from eye level or below.

A similar set of arguments might be



The type of white glass bowl and hanger that put semi-indirect lighting in bad grace with the public as well as the electrical industry

used in connection with the dining and bedrooms, but space does not permit this and moreover this "style" has not yet hit these portions of the homes so hard. This brings us to the point where we may well consider what are the real facts which have led to this fashion. It did not just come in as a mere whim; there really is a good reason why the public stopped wanting ceiling outlets. In many respects it is the fault of the industry itself that this situation came into being. We did not offer to the

public the right type of lighting fixture.

The average individual wants comfortable light. He does not know how to obtain it, but knows when a thing is uncomfortable. He will not use the uncomfortable, and hence, since the bare lamp central fixture was glaring and annoying, fewer central fixtures are being installed. He thinks it is due to the position of the fixture, rather than the construction of the particular fixture he has been using. Now he finds that the bare unshaded bracket units are equally, if not more, uncomfortable, and puts his reliance on portable lamps, for which, if necessary, the housewife can make her own shades.

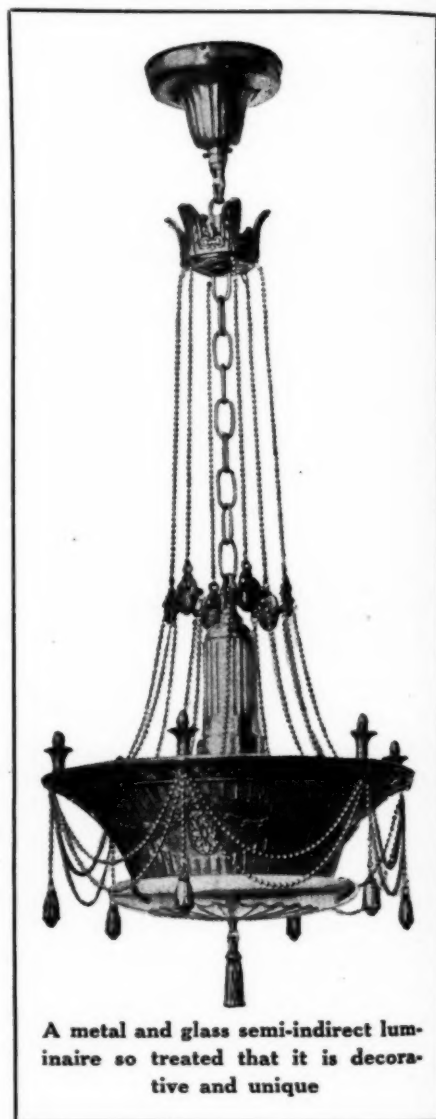
Fortunately, now we are beginning to see a revival in the use of glass and other shades on direct lighting ceiling and wall fixtures. This is a step in the right direction and will help somewhat. But it is very difficult to obtain a reasonably high intensity of illumination in the residential room with any sort of a direct lighting unit without its becoming glaring. If one uses large enough lamps to produce the desired intensity shades become unduly bright, or if one uses large shades, keeping the brightness of a low order, the shades must be so large that the fixture is ugly and ill proportioned.

It seems, therefore, that semi-indirect lighting offers a logical solution to our difficulties. In the first place, the quality of illumination produced is natural, a combination of diffused light reflected from the ceiling and a moderate amount of direct light from the fixture itself. In the daytime we have the indirect light from the sky plus the direct light from the sun. We most certainly must not go back to the old form of white bowl, standing out as an eyesore in the general ensemble of the room. It is up to the fixture designers to incorporate in their product the principle of semi-indirect lighting, still producing a beautiful unit in harmony with the surrounding in which it is to be used.

For those of us actively engaged in the lighting industry it is well occasionally to sit back and look at the art of illumination in retrospect and introspect. Why has a thing been popular, and then fallen into bad grace? Is it fundamentally right or wrong? Will it be revived? We can well ask questions in regard to semi-indirect lighting in the home.

Shortly after the introduction of the Mazda lamp semi-indirect lighting came into considerable vogue. The Mazda lamp was appreciably brighter than its predecessors, the carbon, gem, and tantalum lamps, and brought to forcible attention of the public the need for increased diffusion of illumination. The semi-indirect system was and is a simple and adequate means of obtaining the desired result.

For a while it was very popular. The



A metal and glass semi-indirect luminaire so treated that it is decorative and unique

higher class manufacturers introduced artistic dishes or bowls of varied designs with attractive and decorative hangers. Tinted and toned glassware was used, as well as marble, alabaster, and other diffusing media.

If the practice could have been guided along these lines we would still see much good semi-indirect lighting and the art would have been advanced through the introduction of new methods of applying the underlying



principle. However, some of the second and third rate manufacturers saw the opportunity of making a killing through cheap equipment, and the market was soon flooded with a host of inartistic, even ugly, white bowls carried by three plated iron chains suspended from a simple canopy. The whole fixture sold for very little, and we found the identical style of equipment in the residence as in the barber shop and bootblack parlor.

Naturally, the public lost interest and wanted something different—not through any inherent fault in the quality of illumination, but through the commonness of most of the equipment.

The fixture manufacturers, on their part, saw their business dwindling at a tremendous rate, for any curbstone electrician could buy a cheap white glass bowl and make up a fixture on the job. Because of this and the fact that in general these fixtures were most inartistic in design the better grade of fixture manufacturers accordingly instituted an intensive campaign against this form of lighting. They told the public on every occasion that it was bad practice. In fact, they literally fought the use of glass in any form, and we next saw the market flooded with fixtures using round ball lamps with no glass, or other diffusing medium. This practice has continued more or less to the present day, and we are just now beginning to get the reaction. People are eliminating the central ceiling fixture. They are even talking of eliminating bracket units, and soon the fixture industry will be in another panic, and will wonder why.

#### Development

If semi-indirect lighting is right in principle and we need general lighting, how may we anticipate that the development will proceed?

A few years ago there was introduced a semi-indirect unit of metal and glass which had very desirable characteristics and produced splendid illumination results. In its original form it was not entirely artistic, but has been greatly improved and is susceptible to a remarkable variety of treatment. In spite of the large number of these units which have been installed it never obtained the universal popularity that its makers anticipated, or its good qualities warranted. We demand variety, and it is the writer's opinion that, in their enthusiasm, the makers of this unit recommended too extensive use,

thus creating an involuntary resistance on the part of the industry as a whole.

In passing, it is of interest to note that the French luminaire designers have realized that better diffusion is necessary with modern light sources. They have broken away from tradition and are utilizing the semi-indirect principle more and more in unique and

original fashions. Surely we can do as well as they. It may be true that these designs will not meet the American taste, but there is every reason to believe that a just reward will come to the American manufacturer who, through his ingenuity, adopts the semi-indirect principle to an article carrying out our traditions and style.

### Office Building Installation Details

(Continued from Page 24)

and thus match the rest of the floor covering.

The wire in this system is installed in the same manner as when ordinary conduit is used. On this particular job several of the single conductor fixture wires for low tension were drawn in the duct simultaneously, a home-made reel of iron rods holding the various spools.

There are 10 telephone and bell service boxes per floor, located on the exterior walls of the building, a short distance above the baseboard. By means of terminal strips in these service boxes connections are made to a 20-pair lead covered cable which runs to a combined bell and telephone connection cabinet, situated in the particular wire shaftway nearest to service box. These runs are enclosed in 1½-in. conduit.

In these connection cabinets in the four shaftways the public telephone and low tension circuits separate. Public telephone circuits run in lead covered cable to the main telephone rack in the main switchboard room in the basement. From this rack a 400-pair cable runs to the private telephone switchboard which handles the entire Prudential group of buildings. The low tension circuits from each of these combined bell and telephone connection boxes run in a 30-pair lead covered cable to a low tension cross-connecting rack, which is also located in the main switchboard room in the basement.

It is thus a very simple matter to make connection between any desk on one floor and any other on that floor or on any floor. Every pair of wires in the low tension system terminates on the inter-connecting rack in the switchboard room.

The building is of steel frame construction with flat tile arch floors, the ordinary thickness of the tile arch being 14 in. To prevent the weakening of slabs in cutting holes for outlet boxes a novel scheme was used. Metal sleeves

(see figure 8) made of No. 26 U. S. gage sheet steel were fastened in exact position on the wooden floor forms by nailing through bottom flange.

As specifications required that outlet boxes protrude ¾ in. below plaster finish, a special jig was made which fits flush to the ceiling. This jig contains bent lugs of strap iron on which the outlet box rests at the required depth from tile. Jig is 10 in. square and is made of No. 14 U. S. gage steel. The box fits into a 5-in. circular hole cut in the center and the strap iron lugs are spot welded to the plate. These lugs are drilled to coincide with holes for screws in the ears of the box; the box is thus secured to the jig.

By referring to figure 8 it can be seen that the outlet box is suspended by a short length of ½-in. conduit fitted with a loop at the upper end, through which a scrap piece of conduit was run. Wedges were driven under each end of this scrap piece of conduit, and the jig thus drawn up very securely against the tile. Concrete was then poured into the interior of sleeve and when the box was set the jig was removed.

The arrangement of supporting outlet boxes on the steel columns is shown in figure 9. This support consists of ordinary plumber's strap iron, cut and bent to fit around the column; another strip of the same material was bolted to this, and bent so as to hold the box out at the correct distance. By using this method all boxes can be set and final runs made when on the job, with the assurance that the outlet box will be at the proper location when the fire-proofing is applied later on.

Cass Gilbert of New York City was the architect. The Thompson Starrett Company of Long Island City were general contractors and the electrical installation was made by the L. K. Comstock Company of New York City.

## Inspectors' Salaries and Inspection Costs in Fifty-seven Cities

Minimum Weekly Salary for Inspectors	Average Weekly Salary for Inspectors	Can Inspector be Advanced?	Maximum Weekly Salary for Inspectors	Annual Salary of Chief Inspector	Is It Fixed?	How Are Inspectors Chosen?	Last Annual Expenses of Dept.	Last Annual Total of Fees	Weekly Wage Rate of Journeymen Wiremen			Population per Inspector	Would Better Wages Improve Quality of Inspectors and Inspections?
									High	Avg.	Low		
\$45	\$50	Yes	\$ 60	\$4,500	Yes	C. S.*	\$60,000	\$100,000	\$66	\$44	\$28	50,000	Yes
45	45	Yes	—	3,000	Yes	C. S.	150,000	200,000	50	40	—	30,000	Yes
35	40	Yes	50	5,000	Yes	C. S.	500,000	—	66	44	33	40,000	No
70	70	Yes	100	5,000	Yes	C. S.	264,000	416,000	72	—	—	60,000	Yes
50	50	—	—	2,760	Yes	C. S.	21,000	30,000	44	—	—	70,000	Yes
44	44	No	—	2,880	Yes	C. S.	46,000	47,000	50	—	—	32,500	Yes
32	33	Yes	40	4,400	Yes	Aptmt.	30,000	24,000	61	47	33	55,000	Yes
32	—	Yes	50	4,000	Yes	C. S.	106,000	90,000	66	—	—	22,500	Yes
44	44	No	—	2,700	Yes	C. S.	31,000	46,000	66	—	—	50,000	Yes
44	44	No	—	2,700	Yes	C. S.	50,000	79,000	66	57	33	75,000	Yes
45	45	No	—	3,600	Yes	Aptmt.	10,000	12,000	45	—	—	66,000	Yes
35	40	Yes	46	2,400	Yes	C. S.	7,500	13,000	55	45	35	70,000	Yes
38	38	No	—	2,280	Yes	Aptmt.	—	—	45	—	—	110,000	Yes
35	35	—	—	2,220	Yes	C. S.	15,000	21,000	61	—	22	50,000	Yes
37	44	Yes	44	—	—	Aptmt.	30,000	30,000	48	40	22	60,000	Yes
30	47	Yes	50	3,500	Yes	C. S.	13,000	—	61	—	—	50,000	No
41	41	No	—	3,000	Yes	C. S.	30,000	44,000	61	55	28	55,000	Yes
31	33	No	—	1,900	Yes	C. S.	7,000	7,000	61	—	22	50,000	Yes
51	51	No	—	3,360	Yes	C. S.	27,000	30,000	45	—	—	70,000	No
48	48	No	—	3,000	Yes	Aptmt.	15,000	14,000	61	55	28	50,000	Yes
35	35	No	—	2,100	—	—	30,000	30,000	45	—	—	70,000	No
48	48	No	—	2,750	—	—	74,000	102,000	66	55	45	60,000	Yes
48	60	Yes	—	4,200	Yes	Aptmt.	25,000	18,000	55	—	—	115,000	Yes
48	48	No	—	2,500	Yes	Aptmt.	6,000	19,000	66	—	—	20,000	Yes
35	37	Yes	40	2,500	Yes	Aptmt.	12,000	—	55	—	—	50,000	Yes
40	48	Yes	48	2,400	Yes	C. S.	5,900	6,500	55	45	45	70,000	Yes
36	—	Yes	44	2,800	Yes	C. S.	10,000	15,000	55	44	40	45,000	Yes
36	36	No	—	2,400	Yes	Aptmt.	9,100	9,000	61	55	44	30,000	Yes
50	—	—	—	—	—	C. S.	19,500	6,000	44	38	22	140,000	Yes
35	—	Yes	40	3,240	Yes	C. S.	—	22,500	—	—	—	33,000	Yes
58	58	No	—	—	—	—	6,000	10,000	61	38	—	135,000	Yes
40	—	—	—	2,100	—	Aptmt.	2,560	3,000	55	—	—	100,000	Yes
52	—	No	—	—	—	C. S.	10,000	14,000	55	—	33	55,000	No
32	32	No	—	2,400	Yes	Aptmt.	5,300	5,000	45	—	—	140,000	Yes
30	38	No	—	2,500	Yes	C. S.	7,000	1,500	55	—	—	95,000	Yes
52	52	No	—	3,000	Yes	Aptmt.	6,000	1,500	55	38	—	70,000	No
52	52	No	—	3,300	Yes	C. S.	9,500	19,300	61	45	—	40,000	Yes
46	46	No	—	3,000	Yes	Aptmt.	6,000	6,000	55	—	—	60,000	Yes
50	50	No	—	3,000	Yes	C. S.	6,600	7,000	55	—	30	60,000	Yes
52	52	No	—	2,700	Yes	Aptmt.	6,800	9,900	55	—	—	75,000	Yes
35	35	No	—	2,160	Yes	C. S.	3,000	4,000	66	—	—	60,000	Yes
48	48	No	—	2,400	Yes	Aptmt.	5,100	3,000	40	37	—	70,000	Yes
40	—	No	—	2,400	Yes	Aptmt.	3,750	2,650	45	—	—	40,000	No
35	41	Yes	58	2,500	Yes	Aptmt.	—	—	66	—	—	60,000	Yes
35	48	Yes	48	3,600	Yes	Aptmt.	2,900	2,200	46	—	36	40,000	Yes
35	35	No	—	2,880	Yes	Aptmt.	2,000	2,000	45	42	33	40,000	Yes
50	50	No	—	4,800	Yes	Aptmt.	9,300	10,900	45	—	—	30,000	Yes
43	—	—	—	2,340	Yes	Aptmt.	6,000	8,100	66	45	—	45,000	Yes
32	38	Yes	38	2,400	Yes	Aptmt.	5,000	4,600	45	39	31	45,000	No
40	40	No	—	2,550	Yes	C. S.	2,610	1,500	42	—	—	80,000	No
38	38	No	—	2,400	Yes	Aptmt.	6,400	8,500	55	—	—	35,000	Yes
48	—	—	—	2,700	Yes	C. S.	3,800	5,200	45	—	—	17,000	Yes
32	—	—	—	1,800	Yes	Aptmt.	3,980	3,850	—	—	—	37,000	Yes
32	34	Yes	38	2,100	Yes	C. S.	—	—	—	—	—	35,000	Yes
42	50	Yes	50	—	—	Aptmt.	7,500	15,000	66	—	—	25,000	Yes
30	30	No	—	2,000	Yes	Aptmt.	3,800	3,200	45	—	—	18,000	Yes

\* C. S. = Civil Service Examinations.



# Are Electrical Inspectors Being Paid Enough?

Nationwide Survey Discloses That Average Salary of Inspectors Is Below Average Wage of Wiremen With Little Opportunity for Advancement

THE table on the opposite page gives the results of a questionnaire on the financial aspects of municipal electrical inspection—how inspectors are being remunerated, what there is in their field to appeal to their self-interest, how the inspection departments are making use of the funds they collect in license and permit fees.

The survey was prompted by the belief that inspectors are being paid too little in comparison with their responsibilities. It is a fundamental of economics that a service is rarely worth more than is paid for it. Is it reasonable to expect a man to put his full energy and initiative into checking up on the work of others when those others are receiving from fifty to one hundred percent more money than he is?

## Personnel

Moreover, unless a man can see a desirable goal in his field he will not stay in that field for very long; and whenever turnover in personnel is rapid, efficiency is bound to suffer. Therefore, it seemed advisable to find out what, if any, advancement is possible for inspectors or what there might be in the field to attract men of sound judgment and real ability.

Unusual interest in the subject is indicated by the return from the questionnaire which was sent to all cities of 50,000 population or over. The return was practically fifty percent, whereas that on the average questionnaire is considered excellent if it reaches 25 percent. In all, data is presented here on fifty-seven municipalities, scattered from the Atlantic to the Pacific and having a total population of 31,000,000.

The average weekly salary paid inspectors in these communities is \$40. There are a number of cities which start their inspectors at \$32 a week and several which start them at as high as \$65 and \$70 a week. However, the majority of the cities have a starting salary between \$35 and \$45 per week. It must be remembered here that before a man

can become an inspector he must have had at least several years' experience in the wiring field so that these starting salaries are not being paid to beginners in the industry.

## Advancement

Probably the most disappointing situation revealed in the answers to the questionnaire is that in regard to advancement. It was found that only nineteen inspection departments have any provision for recognizing efficiency of their employees. Thirty others offer the men no particular incentive to do the best job of which they are capable. Eight replies failed to include data on this subject.

Only two cities have any regularly graded method of advancing the inspectors, one of them having junior and senior grade inspectors and the other having four grades for the men. The remaining seventeen provide salary advances which are not very large.

Several cities provide for raising inspectors' salaries to as much as \$60 per week, but average income per inspector throughout the country is \$43 per week.

Even the salaries of the chief inspectors are quite meager when compared with those of individuals in private business who are under similar executive responsibilities. They run from a low of \$1,800 to a high of \$5,000 annually, with an average of \$2,900. In almost every case they are so definitely fixed by ordinance that only the municipal legislative body can change them.

## Journeyman Wages

Journeyman's weekly wages in these 57 communities are on the average about 25 percent higher than the remuneration for the inspectors. They run from a low of \$33 a week to a high of \$72, but the average per week is \$54 which is \$11 higher than the average salary per week of the inspector.

Selection of the inspectors in the larger cities is generally by Civil Service examination, so that inspection is as

much freed from political control as possible. However, in the smaller communities, where there are only one or two inspectors and a chief, selection is usually left to the chief inspector with the appointment to be made officially by the mayor, city manager or city council.

The next two questions were related, in that they were designed to show whether the inspection department was being used as a revenue producer for the city treasury or whether all the fees collected were being used for the proper purpose of providing the best inspection possible. In the larger cities the former would appear to be the case, for nearly all of the municipalities which we can term metropolitan are collecting from fifty to one hundred percent more in fees than they are disbursing for the expenses of the inspection department. Out of the 57 cities represented in the table 23 report substantial profits on their inspection activities, 15 had expense budgets about equaling their income from fees and 14 had deficits.

## Responsibilities

It is difficult to understand the reason for such small salaries when one considers that the inspector must possess a great deal of specialized knowledge and experience and also that he is responsible for the safety from electrical hazards of thousands of his fellow citizens. In several cities, for instance, there is only one inspector to every 140,000 of the population. Fortunately this condition is not found in many places, but even so the average population per inspector in these fifty-seven municipalities is 55,000.

The final question asked the opinion of the chief inspectors about the probable effect of a higher wage. Forty-eight replied that it would induce the men to take more interest in their work, would persuade men of higher caliber to take up the profession and would bring about a higher quality of inspections by the men now doing the work.

### E. A. Arzt, Sioux City

**E.** A. ARTZ, past president of the Iowa Association of Electragists, made his way to success from a start of the type made famous in success stories, for he gained his first business experience as a newsboy on the streets of St. Paul, Minn. He was born at Belle Plain, Minn., coming to St. Paul with his family at an early age. He was educated there and at Minnesota State University. There he received a B. S. degree in 1897 and a Master's degree in the following year. He then entered the College of Engineering from which he graduated in 1899 as an E. E. The part of this record, of which he is justly proud, is that he was self-sustaining during his entire educational period. His first taste of practical electrical experience was with the telephone department of the Western Electric Company, after which he became foreman with the Mississippi Valley Telephone Company at St. Paul. During this period he made some valuable contributions on the subject of "Telephone Disturbances." Following this he undertook central station operation and was superintendent of several plants in Minnesota. Some twenty years ago he turned to contracting, establishing the Electrical Construction Company in Sioux City, Iowa. He is the dean of the electrical contractors in his section of the State. He is noted as a student of electrical problems, being a member of the Sigma Si Society, an honor conferred on account of original research. He is also a member of the American Association of Electrical Engineers. Always active in organization work, both State and local, he took an important part in forming the Iowa Association of Electragists and served a term as its president.



## Electragists You Should Know

### Charles J. Sutter, St. Louis



**C** HARLES J. SUTTER is one of the veteran electrical contractors of the Middle West as well as a charter member of the Association of Electragists, International. He was born in St. Louis and went to work at the age of thirteen as apprentice to a pipe organ manufacturer. This field, however, apparently did not appeal to him a great deal and when he was seventeen he entered the then new and mysterious electrical industry. This job was with a manufacturer of electric bells and alternating current series incandescent light installations. Several years of experience here ended with his taking employment with the chief engineer of the plant who started an isolated d. c. plant contracting business. The development of this business was rapid and when in 1890 the municipality contracted for lighting the business and residence districts with electricity, Mr. Sutter was a recognized authority on electrical contracting. About this time the wiremen formed a local union which became the nucleus for the present International Brotherhood and which is today known as Local Number 1. Mr. Sutter served as its first treasurer and was a delegate to the convention at which the brotherhood was formed. In 1893 he engaged in the contracting business on his own and has operated his establishment continuously to the present day. He became a member of the St. Louis Electrical Exchange, which according to him is the oldest contractors' association in the United States, having been established in 1892. Later he served this organization as secretary and as president. He has been prominent in national association affairs, having served as a member both of the board of directors and of the executive committee which succeeded the board of directors.



# Why Not Consolidations of Electrical Contractors?

By ALBERT A. A. TUNA  
Tuna Electric Company, New York

**C**ONSOLIDATIONS are the order of the day. Pick up your newspaper any morning and you are sure to find listed one or more mergers in some line of business. A carefully planned and well-organized merger constitutes the initial step towards bigger and better business and it seems to me that this principle could well be adopted by electrical contractors.

We have a vast number of "small" contractors. Some of these are using the best materials, the best workmanship and figure their jobs along the same lines, yet they are struggling along "just making a living." Others are of the unreliable, unrestrained, incompetent type that do an unsatisfactory job for less money because they are out to get what they can, knowing that they are irresponsible. Under our present system, our reliable contractors have no weapon with which to combat this condition. Educating the public to the value of efficient and sufficient lighting and power, and pointing out the fallacy and danger of installations based on "price" requires time, effort and money.

Take a day in the life of the average contractor. He arrives at his office and opens the mail. He enters all receipts of the day, if any, and pays the bills that arrive, if the cash balance permits. He answers all letters, makes out his estimates, answers the telephone, and takes care of emergency calls, leaving his place of business to some small boy or girl who knows little of his business and cares less. Have you ever gone on one of your jobs and found out that your men needed a certain small article to complete the job and then have you ever tried to get this for them from a neighboring contractor? You'll find that in one place the boy doesn't know where the stock is kept, in another one the stenographer doesn't know the price and therefore can't sell it to you, another shop is closed for a few minutes with a sign reading "Will Return Shortly?" and so on down the line until you decide to go back to your



**A**LBERT A. A. TUNA is one of the best-known "younger-generation" electrical contractors in New York City, having served as secretary of the Independent-Associated group for several years. He is active in industry affairs as well as in his own business and we are pleased to present his views on the present much-discussed subject of consolidations.—The Editor.

own shop, regardless of the time consumed.

Under the present system a contractor must of necessity be solicitor, estimator, superintendent, purchasing agent, salesman, bookkeeper, chauffeur and telephone operator. This system is economically unsound. It is possible to remedy this through consolidations, by retaining the advantages of each business in the merger, the best executives, the best mechanics, the best customers, and besides reduce the overhead by combining the rents and office salaries. The executives could concentrate on that phase of the business to which they are best adapted without attending to the numerous petty details that claim their attention today. One executive could be office manager, another solicitor, another estimator, another super-

intendent, and by each one doing his particular job to the best advantage of the business the entire output of the concern is systematized.

The customer, in turn, will benefit because the job will be taken care of better. All jobs can be given personal supervision by one of the executives, and the present moderate prices can be maintained with greater profits for the contractors due to lowered costs.

For an example take four moderate-sized active contractors in your own city or town, four contractors with business principles. Then visualize these four contractors merged in one outfit, with one rent to pay in place of four, with two telephones rendering greater service than four individual phones. There would be one electric light bill to pay. A more complete stock could be kept on hand at reduced costs due to increased purchasing powers. One set of books would suffice and there would be only one fire insurance and one burglary insurance policy. Before the merger each contractor would have had to carry one or two extra mechanics for emergency jobs. These men are carried at a loss over a period of years and yet are essential for the service a contractor must render. After the merger one or two men would be sufficient for the combined four contractors. The saving on this one item alone would be enormous.

Part of the savings derived from such a consolidation could be invested in an educational advertising program, which would result in increased business, for the public has become accustomed to look with confidence upon advertised service.

Several drawbacks to successful mergers present themselves, but these can be overcome and the advantages outweigh, by far, the possible handicaps.

The human element is the greatest obstacle to overcome. Business men must choose their partners cautiously and wisely. It would be necessary to

choose men of similar temperaments, men whose principles of business ethics are similar, so that all the component parts of the consolidation are properly synchronized.

The greater part of one's business is built on contact, and the question arises whether this contact can be maintained in a consolidation. Your customer calls upon you because he has faith in your honesty, your reliability, and your ability to do his job satisfactorily. It seems reasonable to assume that as long as you remain an integral part of any combination your customer will continue to patronize you.

Following a merger we feel that the yearly gross volume of business would be greater than the combined previous yearly totals of the individual members because the facilities of the new set-up will allow for expansion. Also more care could be exercised in the choice of customers. Individually, we are gamblers. We are greedy. We take work without sufficient regard for credit risk. It is surprising, considering our ten per-

cent net profit, how readily we take on a thousand dollar job, risking nine hundred dollars in order to make one hundred dollars. Possibly if we realized that for every dollar we lose we have to do ten dollars worth of work to break even we might pay more attention to credit ratings.

In trying to ascertain the possible savings through consolidations we analyzed the statements of four contractors whose combined volume of business last year amounted to \$327,758.98. Their average ratio of overhead to prime cost of sales was 36.5 percent. We then visualized a merger of these contractors. In our analysis of probable overhead expenses we were conservative in judging the savings in rent, telephone, non-productive labor and such other items that made up our totals. We found that the ratio of overhead to prime cost of sales was reduced to 23.9 percent.

It must be remembered, however, that we used assumed figures only, and that actual experience alone will show the true percentage of savings.

### Contractors' Accident Prevention Methods

(Continued from Page 27)

days and weeks of lost time, and real expense, for burns from an arc are deep and slow to heal.

Accidents from rotating electrical machinery, so far as ordinary journeymen electricians are concerned, should rarely occur. There is very little reason why electricians should work over running machinery.

To turn now from discussion of specific disability causes to a more general theme there are two major methods of combatting accident costs, neither of which is receiving due attention from the electrical contractor at present.

The first of these is to support desirable city, state and national legislation. For instance, the only effective way of protecting men from falling objects is to place at least a covering of loose planks on every two or three floors, as soon as the steel is erected. Some states already have a law on their books calling for this protection to be furnished by the general contractor on every job.

Not only should individual contractors and associations take an active interest in passing favorable statutes, but once enacted they should be enforced for the good of every workman,

contractor, and society in general. If the law says that planks should cover every second floor until such time as the permanent flooring is laid electragists should refuse to send electricians on any job until the law is complied with.

The second way in which the accident menace can be met is to adopt proper curative methods where preventive methods cannot be applied.

A lesson can be learned from the army in this respect. Military leaders have long used the best possible means to offset wounds and disease, and have developed the present practice of training each individual to meet the ordinary battlefield wounds with self-applied first aid. To this end, every man in a combat area bears his own little first aid kit, and has received expert instruction in its use.

Industry can well afford to copy. For the electragist, with numerous small crews working on isolated jobs, plus other men laboring alone, two conditions must be met. For the crews there should be supplied a fairly complete first aid kit, containing these supplies:

1 4" Bandage-compress.

2 2" Bandage-compress.  
2 1" Adhesive-compress.  
1 Antiseptic ampoule.  
1 Ammonia inhalant.  
1 Burn ointment, in tube.  
1 Tourniquet.  
1 Forceps  
1 Set wire splints.  
1 4" Bandage.  
1 Gauze compress.  
1 Eye dressing packet.

For the men who must work alone, shifting frequently from one small job to another, such a kit is too large and clumsy, so of greater practical value is a small packet, containing this list of material:

1 Roll gauze.  
1 Tube burn ointment.  
1 Roll absorbent cotton.  
2 Iodine swabs.

The larger kit costs about six dollars for supplies alone, plus two dollars for a serviceable container, while the small outfit may be purchased at any drug store for thirty cents.

#### First Aid

But first aid should not be considered just a matter of daubing tincture of iodine on a fresh wound. There are cases, such as internal bleeding, bone breaks, etc., where the victim is often best left untouched until the arrival of an ambulance; and, conversely, shock, bruises or burns may call for immediate and correct action.

To obtain a correct working knowledge of first aid, its scope and its limitations, every employee should receive expert instruction. Perhaps the average contractor does not know that his insurance company will send a man to any job, to demonstrate practical first aid to the men, and usually not a cent is charged for the service.

In closing, the suggestion may well be made that superintendents avoid employing men who are notorious for their ability to get hurt. The building trades are more free from professional accident victims than are factories, but even so some tradesmen prefer to draw a limited allowance from insurance companies rather than earn a big pay envelope by the sweat of their brows.

Incidentally, a man who is hurt so that he cannot deliver a day's work should be sent home, for the liability insurance laws are designed to care for him during his period of disability.

As a matter of fact, if contractors were stricter in leaving injured men entirely to the tender mercies of insurance companies many workers would be less careless.



# Chats on the National Electrical Code

*A Monthly Discussion of Wiring Practice and Questions of Interpretation,  
Presented with a View Toward Encouraging a Better Understanding of the In-  
dustry's Most Important Set of Rules*

By J. C. FORSYTH

Supervising Engineer, Bureau of Electricity, N. Y. Board of Fire Underwriters

## High Potential Service

There are several points of misunderstanding and dispute regarding the installation of a high potential service as covered in Rule 5,009. The principal questions are:

1. Must a switch be placed in the secondary leads outside of the transformer vault in addition to the circuit breaker or disconnect switch in the primary leads?
2. Are fuses required in the secondary leads in the transformer room if the primary is protected and controlled by a circuit breaker?
3. Are air break disconnectors required in addition to a primary switch or circuit breaker and if so at what point in the line must they be inserted?

Answering these questions in the order given I would say:

1. A main service switch should not be required in the secondary leads either in the transformer vault or elsewhere if an approved and suitable overload circuit breaker is placed in the primary and so located or arranged that it may be operated from a readily accessible point outside the vault. In some cases the occupant of the plant or the lighting company or both may object to any one other than qualified employees being able to operate the primary control either directly or from a remote control switch. In that case a service switch should be installed in the secondary line at some readily accessible point outside of the vault.

2. This is a troublesome question and frequent discussions arise regarding it. We have ruled in our jurisdiction that where the secondary leads are brought from the transformer room to a main switchboard located just outside of the vault or as near to it as is practical, and terminate either in a main fuse block, a main fuse switch or to busbars from which a number of main feeders are supplied, each feeder being protected by its own fuses, that no further secondary fuse protection is necessary either outside or inside of the vault.

3. If no part of the installation other than that contained in the transformer vault is supplied direct from the primary circuit air brake disconnects are not required, but may be installed if desired. If the primary voltage does not exceed 2,300 volts to ground and if the transformer capacity does not exceed 50 k. v. a. per phase it would only be necessary to provide suitable fuses in the primary leads.

It appears to me that the last sentence of this paragraph is incorrect as it now reads and that the word "not" in the second line should be placed in the third line ahead of the word "arranged," thus making the rule read: "In all cases where automatic overload circuit breakers are installed in the primaries and not arranged, etc."

## Service Arrangements

"Air break disconnectors shall be installed between oil switches used as service switches and the supply wires," according to Rule 5003-E. There is no qualifying clause in this rule and it should, therefore, be considered as mandatory; yet when we come to Rule 5009 we find exceptions which completely change the plain intent of Rule 5003-E. Where would the average inspector turn for a final decision as to which rule to enforce? Rule 5003-E is plainly a service equipment rule and has no place in its present location. Rule 5009 says all that is necessary as to service arrangements and the rule referred to is, therefore, superfluous and should be stricken out.

## Motor Room Wiring

An inspector has asked me what is meant by the statement in Rule 5003-G that "where the wires entering the motor room are not in conduit open work may be employed, etc."

(a) "Does it mean that when service wires enter a motor room in con-

duit the other wiring must be in conduit?"

(b) "If the distributing system leaves the motor room in conduit and the service to the motor room is open work, then would all of the wiring in motor room, including service, have to be changed to conduit to conform to this rule?"

In reply to the first question I would say that as the rule is worded the wiring in the motor room would be required to be in conduit. In reply to the second question I would say No. But the rule appears illogical and can hardly be defended on any engineering basis. What has the wiring in the motor room to do with the method by which the service conductors are brought into the room? They are either safe or they are hazardous regardless of how the outside wires are brought in. Why not require that all high potential wires in a motor room be protected by conduit? There would certainly not be enough of it to make such a requirement any particular hardship.

## Number of Small Motors on a Circuit

Under Rule 809b-2 two or more small motors may be grouped on a circuit with two restrictions:

1. That the fuses must not exceed 15 amp. and
2. That the total wattage of this group of motors must not exceed 1,320 watts.

The average rating of motors used in the clothing manufacturing trade for individual machine drive is 1/6 H. P. This rating would allow under the rule approximately 10 such motors on a circuit. It has been found, however, that this number is much too large, particularly when working on heavy goods. The 15-amp. fuses "blow" repeatedly, due to the large inrush of current when three or more machines are started

simultaneously. To secure proper operation and fuse protection we have been obliged to limit the number of such motors to not over 4 on one circuit.

#### What Constitutes a Circuit?

Some very interesting questions have arisen in the application of Rule 702-B. Is a three-wire circuit considered as one or as two circuits? If only one, then the contractor using three-wire circuits can supply twice as many outlets or lights from a gutterless cabinet as the one who employs only two-wire circuits. Do the three-phase wires and the one neutral conductor of a three-phase four-wire system constitute one circuit or three? Is a four-wire two-phase motor circuit a single circuit?

All of these questions have been before us and decisions have had to be made. The object of the rule is to prevent any considerable number of wires being exposed in a cabinet or cutout box when the door is open and also to provide a suitable enclosure for wires where more than four circuits are installed and where they will not be readily accessible to any person operating the switches or replacing fuses. Exclusive of the supply conductors the number of wires which may be carried around in a cabinet from point of conduit entrance to terminal connections was limited to four circuits. Now a three-wire three-phase motor circuit is not a complete circuit if only two wires are installed; neither can two wires of a four-wire two-phase motor line be regarded as a complete motor circuit. If then it is permissible to install four four-wire two-phase motor circuits in a gutterless box, why should it not likewise be proper to approve sixteen wires to be used for lighting circuits in the same cabinet? Would it not be more logical to base this rule on the number of conductors rather than the number of circuits?

#### Appliance Outlets on Lighting Circuits

The question is often raised regarding the number of appliance outlets that may be installed on a circuit and whether or not they may be placed on the same circuit with lighting outlets. The rules seem to be perfectly clear on this point. Rule 890b-2 as to motors and 1602-d as to heating appliances both allow the grouping of motors and heaters on lighting circuits or on cir-

cuits used for these devices alone. The only restrictions in the Code covering the use of appliances consuming 660 watts or less are that they shall not be more than 12 outlets on such circuits, and that the branch fuses shall have a rating of not over 15 amp. The Code does not require a separate circuit for a side wall outlet because it happens to be located in the kitchen or in the bathroom. It is permissible to attach a small motor or heating appliance to each of these 12 outlets if you care to and so long as a sufficient number of them are not operated at the same time so as to cause the fuses to melt, the Code is not violated. You may use one-half or more of these outlets for lighting and the rest for appliances or in any combination you please just so long as the proper fuses are maintained. I am simply trying to state what I think the rules allow and not how they should read.

#### Number of Outlets on a Circuit

In many ways it was a relief to get away from the old 660-watt rule. Not over 16 outlets and not over 660 watts on a circuit became so much a part of our thinking and methods of inspection that nearly two years after the change to 12 outlets and 15-amp. fuses came into vogue we find it difficult to justify the lodging of a violation against an equipment because the contractor has installed 14 or 15 outlets on a two-wire circuit and especially where the total wattage would not exceed 660. The whole purpose of the change was to get away from the 660-watt requirement. No doubt this figure was entirely too low, but to make the "sky" the limit as it is now it seems to be going too far in the other direction. In many cases the limit of 12 outlets on a circuit causes quite a needless expense and under certain conditions is just as objectionable as the 660-watt limit. The argument was that the inspector could count the number of outlets, but couldn't count the watts. This may be true to a certain extent, but the results seems to have been to increase the number of connections to an outlet in the same or greater proportion as the number of outlets was decreased. In these days of flexible cords and multiple plugs the limitation of outlets on a circuit does not count for very much. Would not the intent of the rule—safety and protection—be more nearly accom-

plished if some reasonable wattage limitation (say 1,320) were made and a greater number of outlets permitted than at present?

#### Garages

Rule 3301B reads: "A garage shall be deemed to be a building or portion of a building in which *one or more* self-propelled vehicles carrying volatile, inflammable liquid for fuel or power are kept, etc." Rule 3302-A reads: "Where floor area is sufficient to permit the storage of more than *two* vehicles, etc." The last sentence of this rule reads: "Where the floor space will accommodate not more than 2 vehicles any approved wiring method may be employed." Rule 3302-A, therefore, clearly exempts the two-car garage from the special provisions set forth in article 33. These two rules have caused considerable confusion, as some inspection departments are requiring all garages, regardless of size, to comply with the special rules. This difficulty might be overcome by changing Rule 3301-B to read: "For the purpose of this rule a garage shall be deemed to be a building or portion of a building in which three or more self-propelled vehicles, etc."

Rule 3305 reads: "Where spark producing devices are not located at least 4 ft. above the floor or placed in vapor-proof enclosures, switchboards and charging panels shall be located in a room or enclosure provided for the purpose." This room or enclosure is presumably to prevent the accumulation at and around the switchboard or charging panel of inflammable or explosive vapors. How should such a room or enclosure be constructed to accomplish this purpose? This quite important item appears to have been left to the imagination or judgment of the inspector. It is hardly fair it seems to me to expect the average electrical inspector to be thoroughly familiar with fire department and insurance regulations covering this point. Quite frequently an enclosure approved by an electrical inspector is condemned by a building inspector and they may both represent the same general office. Should not some brief but fairly complete statement be given in the Code that would at least be a guide to the contractor and the inspector indicating the manner to be employed in the construction of a suitable room?



# Red Seal



# Progress

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IN THE period from November 15 to December 15 the total number of Red Seal homes in the United States was boosted from 2,360 to 2,466, this number including both the homes to which awards have been made and those on which applications are pending. In view of the slowing up of residence construction and planning at this season of the year the increase for the month is considered good.

One more community was added to those operating the Red Seal plan when the Electrical League of Omaha made application for license to operate the plan in that territory. Preliminaries are being arranged at the present writing and it is expected that the plan will be in full operation in Omaha early in the spring.

The move to make apartment houses and multiple dwellings Red Seal gains momentum. During November application was made on behalf of a 137-apartment building in Chicago, as well as for a number of similar structures in other cities. These applications actually covered only seventeen buildings, but will confer the benefits of the Red Seal upon nearly 250 homes.

## Manual and Consumer Book Offer

In an effort to bring the consciousness of Red Seal advantages to every electrical man in the country, the Society for Electrical Development recently announced that upon receipt of one dollar it would send one sample copy each of the "Red Seal Operating Manual" and the "Red Seal Consumer Book" to anyone applying for them, whether in licensed territory or not. The customary price of the two books is \$2.15.

## In the Field With Red Seal

LOUISVILLE: The central station has recently completed running a series of six newspaper advertisements on the value of outlets, bringing the Red Seal into each ad.

KANSAS CITY: The total number of outlets in Kansas City's first 44 Red

Seal homes is 26 percent higher than the total number of outlets required by the Red Seal specifications—and the latter are 25 percent higher than the average wiring job.

CALIFORNIA: Instead of promoting Red Seal interest among electrical men, builders and architects by a few large meetings there has been adopted a policy of holding a series of small meetings for the purpose of familiarizing everyone with the detailed operations of the Red Seal plan.

DENVER: The Red Seal has been given the advantage of a tie-in with the electrical department of the city. Through an arrangement with the city electrician all Red Seal certificates issued will be accompanied by a "Statement of Examination of Electric Wiring." While such a form is available to anyone who has had an electrical installation made, they are issued only upon request. It is believed that this

procedure will serve as an incentive to the procurement of the Red Seal approval, inasmuch as the owner of the home will then have tangible evidence of both the safety and adequacy of the wiring system.

EVANSVILLE: The Evansville (Ind.) Electric Club has made inquiry for information regarding the Red Seal plan.

MINNEAPOLIS: Red Seal week in Minneapolis included a broadcasting of the Red Seal story, presentation of a Red Seal play and a Red Seal display during the week in the windows of every electrical dealer in the city.

BOSTON: The Metropolitan Electrical League of Boston has voted to make the Red Seal plan its first major activity in 1927.

TORONTO: The Electric Service League has prepared a Red Seal apartment house specification, two features of which are provision for electric refrigeration and electric ranges.

## Toronto Establishes a Red Seal Monthly



THE first number of the "Red Seal Monthly," published by the Electric Service League of Toronto, went out to a selected list of architects, builders and owners during November. It is shown above. The publication is of four pages

and is intended to serve as an interpreter of the aims of the electric league for good wiring. Some of the articles carried in the first issue explained the nature of Red Seal wiring, the reasons for the adoption of the plan.

# *The Electragist*

Official Journal of the  
Association of Electragists—International

S. B. WILLIAMS  
Editor

H. H. STINSON  
Associate Editor

## Where Do Inspection Fees Go?

We gather from the data presented on page 35 of this issue that municipalities find it pretty profitable to engage in electrical inspection. Attention is drawn to the municipalities where the income from fees exceeds the amount expended by the inspection department.

Did any one ever hear of a city where the inspection could not be improved? Did any one ever hear of a city that had too many inspectors? Did any one ever hear of a city where the inspectors were the very best or where they were paid better than a mere living wage? - How many of these cities are engaged in re-inspection?

Then why are these cities permitted to exact tribute from the public and the electrical industry?

It is the duty of the local electrical industry to insist that its city spend the income from fees in safeguarding electrical installations and not in enriching the city's treasury.

## All-Metal Defined

What is meant by All-Metal? Its enemies have said all sorts of things.

The All-Metal program calls for the encasing of all circuits in interior wiring for certain buildings in a metal armor, of which there are four kinds: Rigid conduit, flexible metallic conduit, flexible metallic armored conductor, and metal moulding.

The buildings for which All-Metal is urged are

- (1) All buildings of whatever sort situated in a fire-proof building zone;
- (2) All buildings which by nature of their occupancy must have the maximum protection against fire such as hospitals, schools, theatres, all buildings where large numbers of people congregate at one time, factories engaged in processes which are highly inflammable, garages.

That's all that "All-Metal" calls for. It does not recommend that "rigid" conduit be used in all buildings. It does not recommend that every building in a city be metal wired.

"All-Metal" recognizes that in certain buildings an added factor of safety is needed. It recognizes that certain other classes of occupancy present conditions which do not require the highest factor of safety for the community.

"All-Metal" is not being urged by the Association of Electragists to supersede knob and tube wiring. The association believes that All-Metal wiring is better than knob and tube wiring, but at the same time recognizes that the latter has a place and will continue to be used for a long time to come. If knob and tube wiring disappears it will be not because of any "All-Metal" campaign by the Association of Electragists, but by the natural law of economics.

The Association of Electragists is not opposed to any form of wiring permitted by the National Electrical Code. It merely goes one step farther than the Code by recognizing that there are certain buildings either by location or occupancy which require the safest form of wiring and for such it recommends "All-Metal." Other buildings may use whatever form of wiring is best suited to their needs.

## Flexible Cord Menace

Next to electric flatirons the worst electric fire hazard that we have is flexible cord. This material offers such a large fire hazard because it is misused by the public and because it is poorly made. It is not easy to educate the public in a short time, but at least the manufacturers ought to be brought in line.

We find cords strung over picture moldings, under rugs, along baseboards, across ceilings, and everywhere imaginable, fastened sometimes with staples, but frequently with thumbtacks. Cords are subjected to the worst abuse of any wiring in the home. Yet 85 percent of all the flexible cord production, we learn on good authority, is not labelled by Underwriters' Laboratories.

One may go into the 5 and 10-cent stores, hardware and dry goods stores—yes, even into electrical shops—and find the flimsiest kind of cord.

Is it true that any old thing may be permitted in a home so long as it is not concealed behind a wall? Or have we been making a mistake in building rules for wiring and in fighting for the integrity of the Code and the safety of the American people?

Is it right to insist on a safe job in a newly constructed building, but close our eyes to all kinds of extensions by inexperienced people using sub-standard cord?

Whose fault is it that all this sub-standard cord is permitted to be used? It wasn't always so?

The public doesn't know the difference in cords. All



cord looks alike, so why not buy on price? And so in the competitive scramble for the business the quality has been sacrificed for price on 85 percent of the cord. And in the lowering of the standard no voice was heard in protest. Those whose job it was to guard the public silently stood by. Everybody is to blame for this situation, but there is no need for allowing it to continue.

Let the public be taught the meaning of "Approved" cord. The fire losses are sufficient for the insurance people to undertake this work—if somebody would sell them on the idea.

The other way is to follow the lead of Portland, Ore., and license all dealers in electrical supplies and appliances. In that way the municipal inspection department can control the quality of goods offered for sale to the public.

### More About Armored Cable

Last month we criticized the market situation in armored cable and apparently hit a sympathetic chord. One manufacturer, however, felt that the editorial might convey the meaning that all producers were cheapening the standard in order to meet competition. This, of course, was not meant; for we believe that certain of the manufacturers would give up producing a product before they would bring out a sub-standard line.

Something, however, must be done about the armored cable situation. The poor qualities of the products of some of the manufacturers are hurting the entire market for armored cable.

Good armored cable is a first rate wiring material and its use should greatly increase, particularly as labor rates advance. Are the unreliable manufacturers going to be permitted to sell the birthright of all?

### Campaign Wiring Prices

During the year we should see a number of power companies starting a rewiring campaign with the contractors doing the wiring. These campaigns can be run off smoothly and with the best of relations, provided there is a mutual agreement in the beginning.

In making a price the contractors should have in mind a cash price. If the utility cares to sell at the same price for terms as for cash, the contractor should not be made to pay.

If the contractor is willing to take some of the work on time payments he should be able to add a financing charge and it is well that this be mutually agreed to at the beginning.

Most contractors will probably prefer to let the utility handle the paper, but they should not accept less than the cash price for the job. The utility may argue that it is carrying the paper for the contractor. That is merely begging the question. The central station carries the paper for the customer. The utility is out selling housewiring for the sole purpose of building its load.

### He Has His Good Points Too

Ever since one can remember, the accusing finger has been pointed at the electrical contractor showing up his weaknesses. Has he no good points, no successes, no bright spots or is he inherently a failure? Let's see.

(1) He has wired the United States for electric service—the country which uses electric service more than all the rest of the world, which actually depends on electric service. These countless homes and office buildings and factories and theatres, etc., etc., must have been well wired to have made the public so insistent for electric service.

(2) It is only recently that the electrical contractor has had assistance from engineers and architects in laying out a building for electric service and even now he has to lay out the greater part of his work. He has done a pretty good job of it too.

(3) Handicapped by the discouraging and unflattering remarks of the rest of the industry he has stuck to his post—he must have courage and a strong faith in the industry.

(4) His clan has grown to over 25,000. There must be something worth while in contracting to attract so many to its ranks.

(5) Contrary to the general opinion, contractors do make money. Not all of them it is true, but just as large a proportion as are making money in other building and retailing trades. Almost every town will bear evidence of successful contractors—nice homes, automobiles, education for the children, amusements, etc.

(6) There are numerous instances of contractors who have been in business over a third of a century, more who have been going for over a quarter of a century while the woods are full of such businesses that are over ten years old.

(7) Electrical contractors are playing their part in public work. It was an electrical contractor who took the Memphis auditorium out of a state of political chaos. We have records of contractors who have been mayors and of others who have held office. Contractors have done their part in the Rotary, Kiwanis and Lions; they have held offices in the clubs and lodges; they are on bank boards; they have presided over electrical leagues—they have shown that their ranks contain leaders.

(8) No small number of wiring supplies and improvements in types have come from the inventive contractor mind.

(9) The contractor has stood for high standards of electric wiring as a protection to the public. He has also worked for and secured, unaided, municipal ordinances to protect the public against unreliable contractors.

(10) He has faced the competition of his jobber, of his utility, of his manufacturer and endured and grown.

Who will say that this man who figuratively has been spat upon, reviled, cheated and hurt in every way possible, is a weakling or an incompetent? If he survives under such rigorous conditions what might he not do under the most favorable conditions!

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<b>ILLINOIS</b>					
Chicago					
Electrical Contractors' Association	J. W. Collins	160 No. LaSalle St.			
Master Elec. Contractors' Association					
Decatur (C) .....	F. J. Boyle	304 S. Halsted St.			
Granite City (C) .....	Earl Weatherford	114 East William St.			
Peoria (C) .....	M. E. Kilpatrick	Nildingham & State Sts.			
Rockford (C) .....	L. B. Van Nuys	238 So. Jefferson St.			
Springfield (C) .....	Donald Johnson	106 North Second St.			
Wheaton (C) .....	A. D. Birnbaum	916 West Cook St.			
	E. C. Krage	133 West Front St.			
<b>INDIANA</b>					
Gary (C) .....	A. B. Harris	570 W. Washington St.			
Indianapolis (L) .....	A. W. Cruge	2405 E. Tenth St.			
Michigan City (C) .....	Walter A. Sassodeck	913 Franklin St.			
Muncie (C) .....	Harry McCullough	113 W. Howard St.			
South Bend (C) .....	R. A. Frink	1338 Howard St.			
Terre Haute (C) .....	C. N. Chess	523 Ohio St.			
<b>IOWA</b>					
Cedar Rapids (C) .....	H. E. Neff	94 First Ave., West			
Davenport (C) .....	Louis F. Cory	510 Brady St.			
Fort Dodge (C) .....	J. A. Paul	16 So. Twelfth St.			
Sioux City (C) .....	E. A. Arzt	211 Fifth St.			
Waterloo (C) .....	R. A. Cole	Cole Bros. Elec. Co.			
<b>KANSAS</b>					
Salina (C) .....	C. G. Loomis	814 Cedar St.			
Wichita (C) .....	P. W. Agrelus	Wichita			
<b>KENTUCKY</b>					
Lexington (C) .....	J. H. Brock	235 East Main St.			
Louisville (C) .....	C. L. W. Daubert	921 South Third St.			
Paducah (L) .....	K. H. Knapp	c/o Paducah Electric Co.			
<b>LOUISIANA</b>					
New Orleans (C) .....	I. G. Marks	406 Mar. Bk. Bldg.			
Shreveport (C) .....	R. L. Norton	620 Marshall St.			
<b>MARYLAND</b>					
Baltimore (C) .....	W. D. Young	Calvert & Franklin Sts.			
<b>MASSACHUSETTS</b>					
Lowell (C) .....	George A. Ryan	79 Middle St.			
Haverhill (C) .....	H. W. Porter	14 West St.			
Malden (Medford, Everett and Melrose) (C) ..	H. J. Walton	c/o Malden Electric Co.			
Springfield (C) .....	A. R. Tullock	11-12 Court House Place			
Worcester (L) .....	John W. Coghlin	259 Main St.			
<b>MICHIGAN</b>					
Detroit (C) .....	N. J. Biddle	112 Madison Ave.			
Grand Rapids (C) .....	T. J. Haven	1118 Wealthy St., S. E.			
Kalamazoo .....	E. R. Hummel	1121 Seminary St.			
Saginaw (C) .....	E. T. Eastman	209 Brewers Arcade			
<b>MINNESOTA</b>					
Duluth (L) .....	Morris Braden	c-o Minn. Pow'r & Lt. Co.			
Minneapolis (C) .....	W. I. Gray	209 Globe Building			
<b>MISSOURI</b>					
Kansas City (C) .....	A. S. Morgan	4 E. Forty-third St.			
St. Louis					
Electragists' Ass'n (C)	W. F. Gerstner	120 No. Second St.			
Electric Employers' Association (C) .....	G. L. Gamp	Wainwright Bldg.			
(C) designates exclusively Contractor-Dealer organization.					
(L) designates an Electrical League.					

# DECEMBER ACTIVITIES

## St. Louis Is Chosen for 1927 Annual Convention of the A. E. I.

Convention to be Held in Week of August 8 at Hotel Chase—Hotel Selected as Headquarters Is at Edge of Great Park and Is Southwest's Finest Hostelry



The Hotel Chase, St. Louis, at Which the 1927 A. E. I. Convention Will Be Held

**T**HE next convention of the Association of Electragists, International, will be held at the Hotel Chase, St. Louis, during the week of August 8. This decision was reached by a unanimous vote of the executive committee of the association, taken during December.

This will bring to St. Louis the honor of having entertained two annual conventions of the national association, since the fourth annual convention was held in that city during September, 1904. At that time the entire membership of the association was only 402, about one-third the registration which is expected at the 1927 convention.

The hotel selected for the meeting is by far the finest in St. Louis and excels in spaciousness, refinement and comfort any hotel used for electragist conventions in many years. In addition to its interior attractions it is located across the street from Forest Park, the second largest municipal park in the United States. It is named the playground of St. Louis, containing as it does many tennis courts, two golf courses, lakes, an aviation field and the famous St. Louis Municipal Opera.

For the purpose of a convention the hotel is exceptionally well laid out. It includes a large exhibition hall, a convention hall and many meeting rooms. The Palm Room which will be used for the exhibition is 150 ft. long and 60 ft. wide, providing a beautiful setting for the exhibition. This opens directly into the Convention Hall with broad glass doors which may be swung wide open during exhibition hours and closed during the convention sessions. The hotel has two roof garden restaurants and it is planned to hold this year's annual banquet under the open skies.

Rates at the hotel, which is run on the European plan, will be published in full in a later issue. Outlined briefly they run from \$3 to \$6 a day per person. The accommodations at the Chase will be reserved entirely for electragists, but arrangements will be made to accommodate other representatives of the industry at three other hotels within one block of the Chase.

Selection of the week of August 8 was made with the entertainment of the delegates in mind. The first and most outstanding of these features is the famous outdoor Municipal Opera in For-

est Park, which is attended by 5,000 persons every night during the six weeks of the season. That week also boasts the premiere of the outdoor "Style Show," given at the Garden Theater in St. Louis County as the feature of the annual Buyers' Week. This is a very elaborate production, approaching a musical revue in its lavishness, and will appeal to the men as much as to the women.

The Convention Program will be about as follows:

Monday, August 8—Golf Tournament at one of the many fine golf clubs within easy reach of the Hotel Chase.

Tuesday, August 9—Opening of Manufacturers' Exhibition; Executive Committee Meeting; Special Group Meetings in charge of Local and State Associations; evening, Style Show in the outdoor Garden Theatre.

Wednesday, August 10—Formal opening of Twenty-seventh Annual Convention. Sessions morning and afternoon; evening, Municipal Opera in the outdoor Municipal Theatre in Forest Park.

Thursday, August 11—Convention sessions, morning and afternoon; evening, Convention Banquet, to be held on the roof of the Hotel Chase with special music, entertainment features and group singing.

Friday, August 12—Closing sessions of Convention and Exhibition.

## First Conviction Under Portland Stock Inspection Ordinance

The first conviction under the Portland (Ore.) ordinance forbidding the sale of electrical appliances not approved by the National Board of Fire Underwriters occurred on December 16 and electrical men in that section hail the decision as setting a precedent for further arrests. The case was that of L. C. Lewis, manager of the Lewis Importing Company, who was convicted of having sold boudoir lamps and Christmas novelties of an electrical nature which constituted fire and life hazards. The articles were of German and French manufacture.

During the trial of the case it was brought out that the sale of the goods had amounted to \$40. Lewis was fined \$25 and ordered to remove the goods from the city. City Electrical Inspector J. J. Caine, who made the arrest, declared that other dealers handling similar goods would also be brought into court.



## Hill Joins A. E. I. As Field Director

Robert C. Hill, widely known in electrical circles as an expert on business administration, has been appointed Field Director of the Association of Electragists, International, the appointment to take effect on January 1, 1927. This announcement from A. E. I. headquarters comes as a fitting climax to a year in which the field work of the association has gone forward with greater strides than ever before.

Mr. Hill has had years of experience as comptroller and treasurer in the central station field. For a large part of this period he had the position of comptroller of the United Gas and Electric Company, a holding company which operates 53 central station properties, located in 23 states. Following this he was treasurer of the Cleveland Electric Illuminating Company.

In the last few years he has had close association with the contractor-dealer field in New England and recently has been operating the Business Administration Bureau, Inc., which was formed to render an intensive assistance to contractor-dealers in accounting and in systematizing and administering their business.

The work of this bureau, according to statements of his clients in New England and of the jobbers in that territory, was of great value to the contractor-dealer and, being much along the lines of the field work planned by the A. E. I., has made Mr. Hill particularly fitted for his new position.

## Des Moines and K. C. First Under Field Plan

Des Moines, Ia., and Kansas City, Mo., are the first two cities in the country to put into operation the new field plan of the Association of Electragists, International, under which local field work will be under the direction of a trained and full-time business manager.

The decision of the Des Moines association, which now becomes the Des Moines Chapter of the A. E. I., was announced after a meeting held on December 14. The meeting was addressed by A. P. Peterson, field representative of the A. E. I., who explained the plan and it was then voted to confirm the appointment of Richard C. Trembath as business manager. Mr. Trembath has

recently completed a short training course at A. E. I. headquarters.

The increased budget of the association is to be met by an assessment on the members of three cents per productive labor hour of journeyman labor and one cent an hour for shop labor with a minimum of \$2.50 per week and a maximum of \$12.50 per week.

Officers of the new Des Moines Chapter are J. R. Payton, president, and V. Thom, secretary.

In Kansas City the field plan goes into effect on January 1, with much the same arrangements as exist in Des Moines. Claude R. Bachmann has been appointed business manager and will come to New York headquarters shortly after the first of the year for ten days' training in the work.

## Industrial Sales Problem in Questionnaire

A questionnaire has been sent out by the Southern Division of the California Electragists to all its members in an effort to determine their position on the problem of sales to industrials by job-

bers at dealers' prices. This matter is in prominence on the program of the executive committee of the association.

The questionnaire asked the following questions:

1. Give your definition of "an industrial," keeping in mind that your committee is attempting to compile a major classification of contractor-dealer customers whose business falls within a limited and distinctive type of activity commonly known to our trade as "industrial."

2. Give a complete list of names and addresses of all your customers, present and prospective, whose business you enjoy either wholly or in part whom you consider "industrial customers" in accordance with your definition; and in addition a similar list of possible customers whose business you might enjoy in the absence of jobber competition through direct selling.

3. Cite all specific instances where the direct sale of materials at dealer prices (or lower) from jobber to consumer has curtailed your current business with such consumer or has infringed your legitimate opportunity for new business.

## California Jobbers Promote Spread of Standard Accounting System

THE Association jobbers in California have become a unit in supporting the efforts of the California Electragists to have every contractor install the Standard Accounting System. Recently the Gra-

ham-Reynolds Electric Company, Los Angeles, sent out the following letter to all the contractors on its books, bringing to their attention the advantages of the Standard Accounting System:

Dear Sir:

It has been our observation in covering the electrical contractor field, that the bookkeeping systems generally used are somewhat inadequate, as they do not bring out the points that are essential for your information.

Are you satisfied with your present system of bookkeeping? Does it bring out the following facts:

1. Prime cost on each job.
2. Gross profit on each job.
3. Operating statement end of each month.
4. Profit and Loss statement end of each month.
5. A complete picture of your business end of each month.
6. Analysis of over-head expense end of each month.

If your present method does not bring out the above, you are overlooking the vital points necessary in conducting your business.

It will not be long before the first of the year, at which time you will be required to furnish information to the Government regarding income tax. We find some are paying considerably more taxes than they should due to faulty bookkeeping methods.

The electragists are presenting a bookkeeping system which will give you the facts as outlined above, and which can be installed at a very nominal charge.

As we are all working for the benefit of the industry, we are anxious to give what help we can, and if you are interested in the above, please advise us.

Thanking you for your courtesy, we are

Yours very truly,

GRAHAM-REYNOLDS ELECTRIC COMPANY.

### Executive Committeemen Returned

The annual election of executive committeemen of the A. E. I., held during November, resulted in the return to office of all those who stood for election in 1926. These included representatives of the Southern, Central, Eastern Canadian and Pacific Divisions. Those re-elected from these divisions respectively were Joseph A. Fowler, A. Penn Denton, R. A. L. Gray and Clyde L. Chamblin.

### Lake County Electragists Entertain Employees

The Lake County (Indiana) Association of Electragists, whose membership covers the cities of East Chicago, Gary, Hammond, Indiana Harbor and Whiting, entertained their wives and office employees with a banquet at Lake Front Park Pavilion in Gary recently. About one hundred guests were present. Entertainment and dancing followed.

The association has many activities under way at the present time. One committee has recently completed a series of association advertising for the holiday season. Another committee is busily engaged in making arrangements for the State meeting to be held in this district the latter part of February. A well balanced program of business talks and entertainment is being prepared.

The association holds weekly meetings and at recent meetings the members have listened to talks on Accounting and on Liability Insurance.



The Fall Dinner of the Lake County Electragists and Their Employees

### Wiring Conference Seeks Data From Leagues

In an effort to sound the opinion of a complete cross-section of the electrical industry on the effects of the present costs of wiring, the Industry Conference on Wiring, through its chairman, Earl T. Whitehorne, has sent out a questionnaire to all the electric leagues in the country. A letter accompanying this asks each league to hold a meeting, discuss the subject and report the consensus of opinion of its members back to the Wiring Conference. The questions submitted for discussion are:

1. How should the electrical industry set about the next big wiring job, to complete the installations in inadequately wired homes and to re-wire and re-fixture obsolete installations?
2. Do you feel that such wiring developments or the use of electrical energy in your territory is being retarded either by the cost of wiring or the cost of current?
3. What proportion of the wiring in your city today is all-metal (including rigid conduit, armored cable and metal molding) and how much is non-metal (knob and tube, etc.)?
4. Does the all-metal wiring standard, no matter whether it be more or less expensive, tend to restrict the market for wiring?

The National Electric Light Association, which is expected to submit a brief at the next meeting of the conference, has held up preparation of this brief until receipt of the information requested from the leagues.

Further data on the subject of wiring costs is being sought by the Electrical Porcelain Manufacturers' Association which has sent out a post-card questionnaire to contractors throughout the country, asking their opinion on all-metal wiring and non-metal wiring.

### Bayonne Passes New Electrical Ordinance

An ordinance creating an electrical bureau in the Department of Safety of the City of Bayonne, N. J., was passed on December 14 by the board of commissioners of that city. It provides for the appointment by the board of a superintendent to have charge of examinations, licensing and inspection work.

The examination fee for license as master electrician is fixed at \$5 and the cost of the first year's license as a master electrician is set at \$50, with a \$5 annual fee for renewal. Contractors who are not resident in the State of New Jersey must pay a license fee of \$150 for each year they do business in Bayonne.

A feature of the ordinance is the requirement that wiring and appliances installed in places of public amusement must be inspected weekly.

Violation of the ordinance is penalized with a \$25 fine for the first offense, a similar fine for the second offense and \$100 fine for all subsequent offenses.

### Electragist Meeting at Decatur

The new field program of the Association of Electragists, International, met with hearty approval when presented at a meeting of the south central division of the Illinois Association of Electragists at Decatur on December 3. According to plans it will provide a field man for the state association, who will render personal service in accounting, estimating and general business practice.

Another meeting of the division is scheduled for Decatur on January 6.

### Copper Association to Have Rewiring Booklet

The general inadequacy of electric wiring in the great majority of American homes today represents a situation which is interesting not only to electrical contractors, public utilities and electrical manufacturers, but to the copper industry as well. The prospect of countrywide improvement in house-wiring installations as a means for increasing the market for copper in the form of wire, has attracted the attention of the Copper & Brass Research Association, which is now planning an advertising and publicity campaign addressed to the home-



owner, which will stress the importance of modernizing house-wiring installations from the standpoint of convenience and better lighting. This campaign will be conducted in similar manner to others which the Copper & Brass Research Association has been carrying on in the general building field, as for example the campaigns on brass pipe, copper leaders and gutters, and copper and bronze screen cloth. One of the first guns in the campaign will be the publication of a handsomely printed booklet for public distribution.

### Illinois Prepares Inspection and Licensing Bills

Two bills have been prepared by representatives of the electrical industry as the upshot of the conference on legislation, held at Rockford last month. One makes it legal for a municipality to enforce local ordinances governing electrical installation work and the other determines the character of the local commission to handle all matters pertaining to local rules and regulations. It is expected that these bills will be in shape for submission to the legislature early in January.

### A. C. E. Division to Meet in February

It has been announced that the annual meeting of the A. C. E. (Northern Ohio) Section of the Association of Electragists will be held at the Hollenden Hotel, Cleveland, on February 3. The meeting place has been chosen with the view of enabling the members to attend the National Lighting Equipment Exhibit which will be in progress at the Hollenden at that time.

### Indiana Electragists Favor State Code

The formation and adoption of an electrical code by the State of Indiana was urged at a meeting of the Indiana Association of Electragists, held in Indianapolis on November 18. The principal speaker at the meeting was J. H. Owens, secretary of the Administrative Council of Indiana, which is working on the proposed state electrical code.

After Mr. Owens had finished, the meeting was opened to a general discus-

sion of the subject in which all those present took part and all phases of the question were discussed.

It was then resolved that the association go on record as recommending to the Administrative Council, that the Rules and Regulations of the National Board of Fire Insurance Underwriters be the basis of the Rules and Regulations of the Electrical Code as adopted by the Administrative Council of Indiana. Motion carried.

Mr. Owens invited the association to appoint a committee to meet with his committee to consider revising the National Code to meet conditions in Indiana. This invitation was accepted and the Chair appointed a committee consisting of Mr. Wadleigh, Chairman, Mr. Nolting and Mr. Brassie, to meet when called by Mr. Owens.

It was resolved that the association recommend to the Associated Building Contractors of Indiana that they endeavor to have the cities and towns act amended so that it will be legal to license contractors connected with the building industry provided it meets with the approval of the other branches of the building industry.

### Lamp Consignment Plan Is Upheld

The plan of distributing incandescent electric lamps by the consignment plan, in use by the General Electric Company and its licensees since 1912, has been upheld in a decision of the United States Supreme Court handed down on November 23. The decision was in a suit brought by the Government to enjoin the General Electric Company and its licensees from violation of the Anti-Trust laws on these two counts: That the consignment plan was in restraint of interstate trade and a monopoly and that the contract of the General Electric Company with its licensees was invalid.

The consignment plan had been adopted in 1912 after the Government dissolved an illegal combination for fixing re-sale prices on lamps. At once the Government instituted suit against this plan and it has been on trial since that time. The point involved was the difference between an agency and a sale and the 1926 decision has cleared up this point and settled the validity of the consignment plan.

## Rochester Contractor School Termed Highly Successful

Course Extending Over Six Weeks Took Up Various Phases of Estimating and Included Speakers on Administration and Accounting and on Sales Work

AFTER a most successful series of meetings, extending from November 6 to December 16, the contractor school, organized under the auspices of the Electrical League of Rochester, N. Y., came to a close with a talk on "Sales Responsibilities of the Electrical Industry" delivered by Walter Drey of Forbes Magazine. The average attendance at all sessions of the school was in the thirties, which is felt by those to indicate that the contractor was in thorough accordance with the objective of the course.

One of the main features of the course was the series of estimating lessons, presented by Arthur L. Abbott, technical director of the A. E. I. The first section of this dealt with estimating large work, which included the standard conduit job, small and large industrial plant jobs, another section dealt with

housewiring and a third dealt with rigid and flexible conduit apartment house work, rigid and flexible conduit work in commercial buildings, exposed armored cable work, metal molding work and exposed rigid conduit work.

The administration and accounting phase of the course was divided into three periods on these subjects respectively: "Why You Are in Business and Particularly in the Electrical Contracting Business"; "Where Are My Profits—Am I Acquainted With Old Man Overhead"; "Why Is Accounting Necessary in Business." These talks were made by A. E. McCoy, C. P. A.

The selling course was divided into three sections also. At the first Frank Watts, editor of Electrical Goods, spoke on "Co-ordinated Sales Effort." Ralph Barstow, nationally known sales expert, gave the second talk, while the third session was addressed by Mr. Drey.





ness a clubhouse of its own. The "Shack," as they have titled the club, is located on the shores of Lake Mendota, directly across the lake from the city.

It is a fine two-story building containing a kitchen, a dining room, a living room, a screened porch and several sleeping rooms. Officers of the Madison organization are Albert Endres, president, and Lawrence A. Ring, secretary. Otto Harloff is chairman of the house committee.

### Northwest Inspectors' Convention Program

A long and well diversified program will be presented at the 1927 annual convention of the Northwest Association of Electrical Inspectors to be held at the Multnomah Hotel, Portland, Ore., on January 18 and 19.

The principal papers to be presented are as follows:

"The Power Company and Its Relation With Inspectors, Contractors and Consumers," by T. S. Swartz and G. A. Drewett.

"Diversity of Range Load as Effecting Wiring Installations," by George Thatcher.

"Electrical Hazards and Their Elimination in the Grain and Milling Industry," by N. J. Sankela.

"Fire Alarm Protection for Hotels and Rooming Houses for 300 or More Guests," by C. W. Lynch.

"Our Choice—One Code or Babel," by W. J. Canada.

"Electrical Transmission and Distribution System in the Mills of the Long Bell Lumber Company," by L. D. Beach.

"Electrical Inspection of Industrial Plants," by W. E. Roberts.

"Eliminating Sub-Standard Electrical Appliances," by J. C. Caine.

### Building Employers Oppose 5-Day Week

That the building trades employers of the country are united in their opposition to the adoption of the five-day week in the construction industry was shown at a meeting held in Pittsburgh on December 13. Approximately 150 of the leading building employers of the country, representing nearly 30 of the leading cities, in attendance at the meeting, voted unanimously to stand against any further wage increases and the establishment of the five-day week. The consensus of opinion was that the country was ready for another big year of construction, but that the establishment of the five-day week would seriously retard building.

This action closely followed the meeting of the New York Building Con-

gress on December 8, at which William Green, president of the American Federation of Labor, explained labor's reasons for asking the five-day week.

### New York E. C. A. Issues Nominations

The Electrical Contractors' Association of New York has issued its regular nominations for officers for 1927 as follows: W. J. Taverner, president; J. P. Hall, treasurer; Walter Knapp, secretary; A. Henry, J. R. Strong, C. F. Kisting, A. Coggeshall, M. S. Blumberg, J. Livingston, J. C. Hatzel, L. Fried and J. M. Watters, executive committeemen.

The election will be held in January.

### Headrick Is Denver League Secretary

E. C. Headrick, A. E. I. executive committeeman, has been elected to the post of secretary of the Electrical League of Colorado for the fiscal year of 1927, in the league elections held during December. Other officers for the coming year are: F. M. McCammon, chairman, and Dean D. Clark, treasurer.

### Snap Switch Code Revisions

Revisions in the snap switch code of the Underwriters' Laboratories are listed in a number of new sheets which have been sent out by the laboratories. The changes have to do mainly with construction and test standards.

### California Motor Division Under Way

The initial meeting of the new motor section of the California Electragists, Southern Division, was held on November 23 at Los Angeles and possible agenda for future meetings was discussed. The object of the new section will be to establish a closer harmony between contractors engaged primarily in the motor trade and to correct unsound trade practices and policies now existent in the motor sales field.

### Move to Stabilize Mortgage Bonds

An initial step in the movement to stabilize the first mortgage bond business and through that the entire specu-

lative building investment field was taken at a national conference held on November 30 in New York City under the auspices of the American Construction Council.

The conference by resolution authorized a complete survey of the first real estate mortgage bond industry by a special committee, headed by Franklin D. Roosevelt. At a later meeting this committee will report on the best means of developing uniformity of sound practice in the industry.

### Electrical League of Utah

The organization which for many years has been known as the Rocky Mountain Electrical Cooperative League will henceforth be called the Electrical League of Utah, according to an announcement effective December 7. The present address, 215 Kearns Building, Salt Lake City, will be unchanged.

## OBITUARIES

### James A. Delmer

James A. Delmer, president of the Delmer Electric Company, Pittsburgh and Erie, Pa., and one of the best known electrical contractors in Pennsylvania, died at his home in Pittsburgh on November 25. He was born in Housedale, Pa., in 1891 and his boyhood was spent in Nant y Glo, Pa., where he entered the electrical field as a helper in the mines. Later he went to Pittsburgh and worked in the Westinghouse testing laboratories. In 1915 he and his brother, the late Henry Delmer, opened an office in Pittsburgh and engaged in electrical contracting. A branch at Erie was established in 1923, with Stanley S. Nash and William S. Hurley as associates. In the eleven years of the firm's existence it installed many of the large electrical jobs in the state.

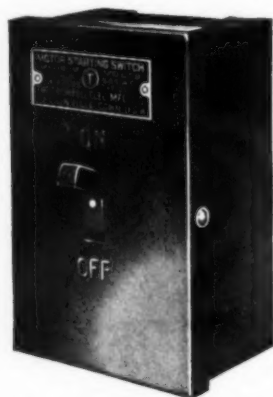
### John T. Whitehead

John T. Whitehead, first president of the Independent-Associated Electrical Contractors and Dealers of Greater New York and one of the best-known electrical contractors in the metropolitan area, died at his home on November 13. Mr. Whitehead had been in the electrical business in New York for nearly forty years, but retired from active business two years ago.

## News of the Manufacturers

### Motor-Starting Switches

The Trumbull Electric Manufacturing Company, Plainville, Conn., has added two new motor starting switches, tumbler type, to its catalogue, under the designations Nos. 2361 and 3221. The first is 3-pole, 600 v., for sur-



face mounting only. It is contained in a black enameled box and is designed to meet the growing demand for a small 3-pole tumbler switch for use with polyphase motors. No. 3221 is 2-pole, 250 v., for single phase a. c. or d. c. motors, rated to  $\frac{3}{4}$  hp. It is without box and is equipped with plate for flush



work. It is particularly adapted for use with motor driven machines and heavy duty lighting circuits. A steel guard protects the operating lever.

### New Type Clamp

The Chicago Fuse Manufacturing Company is now furnishing "Union" outlet boxes for sheathed and metallic cable or loom with a new type clamp, which is tightened after the box is installed. The box is hung in the usual way, with or without bar hangers, the cable or loom brought through the knockouts, pulled up tight and the clamp screws down. The screw heads are on the inside of the box and with the clamps are placed diagonally, as shown in the illustration. The angle is such that the screw heads are easily accessible to the screw driver in all boxes, including those with bushing plates. In boxes  $1\frac{1}{2}$  in. deep the diagonally placed clamp will fasten the loom or cable whether it enters from the knockouts in the bottom or those in the side.

The company also has announced a new type clamp furnished regularly with their standard sectional switch box, type XC; bracket switch box, type Gem XCB; and Lockite switch box, type Gem XCT. These

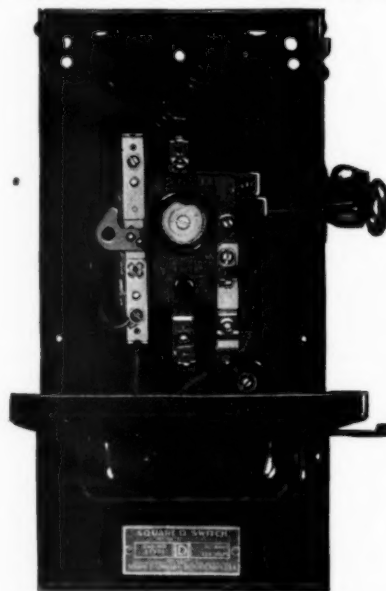
boxes take sheathed or metallic cable or loom. The new type clamp is known as their No. 7 and differs from others in that it has a right angle flange. When the clamp is placed over the cable or loom the flange effectively closes the opening.

### Oscillating Fan

A new fan—the "Junior" 10-in. oscillator—is being offered for the 1927 season by the Emerson Electric Manufacturing Company, St. Louis. It will be in addition to the line of 9-in. oscillators offered last season. It is of the induction type for 110 v. 60 cycles, with a switch in the base. The oscillating mechanism has a  $\frac{1}{2}$ -in. steel shaft and an oil-tight, dust-proof bearing. The finish of the motor and the base is polished black enamel and the blades are of the Parker type with dull brass finish.

### Main Fuse Switch

The Square D Company has announced the addition of a new accessible main fuse switch, with distribution cabinet, to its line. This new type switch has main fuses which are



accessible when the switch is "off." The switch has one fuse, one switch blade and a solid neutral. The distribution cabinet provides for two branch circuits. Wiring connections between the switch and the branches are made at the factory.

### Midget Vacuum Cleaner

A small vacuum cleaner is being produced by the Metal Specialties Manufacturing Company, Chicago, under the name "Presto-Vac Junior Vacuum Cleaner." The machine is 110 v. universal type and is controlled by a positive action toggle switch in the handle. It weighs  $4\frac{1}{4}$  pounds and is 12 inches long. Equipment includes fifteen feet of heavy insulated cord and attachment plug. The twill bag is connected to the cleaner with bayonet

socket and is easily removed for cleaning. The cleaner has been designed particularly for cleaning furniture and automobile upholstery, clothing, drapes, stair carpets and places inaccessible with machines of standard size.

### Plural Plugs

George Richards & Co., 557 West Monroe Street, Chicago, has just announced the addition of two "Hemco" convenience outlets to its plural plug line.



"Thru-Lite" is designed with one screw-type threaded outlet permitting the light to hang straight down and two prong-type side outlets. It is a screw-in type plug and the down outlet is equipped with threads to take standard shade holders. The side outlets are provided with a self-locating feature and will fit all standard prong type attachments.

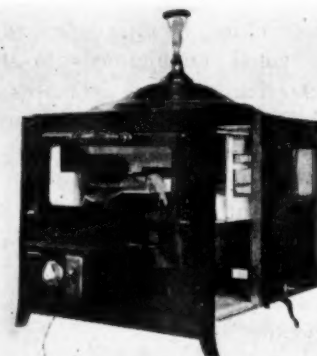
"Trip-Prong" plug is designed for prong-type receptacles being similar to the "Hemco"



tee-prong plug except that an additional prong-type outlet provides three instead of two outlets. It is designed for all standard prong-type receptacles and all prong-type attachments. It fits close to the baseboard at the same time permitting the connecting of all types of attachment plugs.

### "Hot Dog" Cooker

A sanitary, electrical "hot dog" cooker, shown in the illustration, has been invented and will shortly be put into production by John F. Costelow and J. C. Sunderland of Kansas City, Mo. Mr. Costelow is a member





# X-Ray Color-Ray



JACK reflector for  
150-watt lamp uses  
Color-Ray No. 440.



QUEEN reflector for  
200-watt lamp uses  
Color-Ray No. 55.

JILL reflector for 150-  
watt lamp uses Color-  
Ray No. 441.

The Color-Ray No. 55 is shown above ready to clip on to the King reflector. All the new Color-Ray equipment includes four sheets of gelatin in amber, green, blue, and red, with each set.

## Colored Light Stops Them!

Passers-by always crowd about the show windows flooded with colored light.

Merchants everywhere realize the important part color is playing in sales-display. Profit by this sentiment by selling X-Ray Color-Ray! It is light, strong, and inexpensive, and is becoming more popular daily.

*Every Merchant Needs the Color-Ray!*

**CURTIS LIGHTING, Inc.**

1119 West Jackson Boulevard

CHICAGO

New York—31 W. 46th St.

Los Angeles—3113 W. 6th St.

of the Association of Electragists, International. The machine is designed for the cooking of frankfurters in a sanitary manner by the use of direct and reflected heat. When the cooking is finished the sausage drops into an electrically heated storage magazine ready to be served. In addition the machine bakes a specially prepared bun. It has a capacity of 650 sandwiches an hour and is rated at 2.5 kw.

### Wiring Devices

A new line of canopy pull sockets is being put out by the Arrow Electric Company, Hartford, Conn. The device is an arrangement of the ordinary brass shell pull socket body so that it can be mounted in canopies. A hook slips over the chain guide and holds the interior in the shell while a notch engages with the canopy ring and prevents the socket from rotating.



The Arrow company has also added several new items to its porcelain line, several of which are illustrated here. The new items include four types of 2¼-in. shadeholder bodies, three types of 4-in. shadeholder bodies and seven types of wall bracket and ceiling bases. The main point of interest regarding the 2¼-in. and 4-in. shadeholder bodies is that the body and shadeholder are made of one piece of porcelain.

### Conduit Benders

The Fullman Manufacturing Company, Latrobe, Pa., has announced a conduit bender which is claimed to combine two tools in one. It has a reversible jaw for bending ½-in. and ¾-in. conduit. When in use, it is said, there is no strain on the pin which fits loose in the movable jaw since the bender castings take all strain imposed when bending the conduit. Another advantage claimed is that the bender will not slip or kink the conduit when making the usual bends. It is designed with a deep socket, threaded internally at the bottom, for 1-in. pipe handle, eliminating the use of couplings and insuring full strength of the pipe handle.

Other products on which the company has recently made announcements include gang floor boxes of the adjustable cover type with 3½-in. square brass covers; gang floor boxes of similar type except that they have 3½-in. round brass covers; floor boxes of the non-adjustable round cover types, 3½-in. high and with one ½-in. conduit hole in each of two sides and two ½-in. conduit holes in the bottom; fish wire made in seven sizes to meet all conditions on the job.

### Light Iron

A convenient light iron for traveling and boudoir use and for all light ironing is being introduced by the Dover Manufacturing Company, Dover, O., under the trade-name "Bonnie Dover." The iron weighs 2½ lbs., has 2⅝-in.x5-in. ironing surface and has six feet



of silk cord with separable connector plug. It is rated at 220 watts. The iron is sold in a leatherette traveling bag which protects both the iron and the clothing when it must be packed in suitcase or trunk.

### Body-Warming Appliances

Production of a special woven fabric so constituted that the heating wire or wires may be worked into it in order to give the desired distribution of heating effect over a garment of whatever shape and design that may be selected makes possible the placing on the market of a number of new and useful electrical appliances. The fabric is being made by Walter D. Graham, 442 West Carroll Avenue, Chicago. There is a suit for aviators, electrically heated and which is connected to the battery of the aeroplane when being used. A sleeping porch blanket, a warming belt, a warming neck pad and an electrically heated health blanket for hospital and home use, comprise some of the other devices in production.

### Manufacturing Notes

A catalogue listing and illustrating its line of vitrified pottery lighting fixtures has been issued by the Franklin Pottery, Inc., Lansdale, Pa.

Price List No. 100, cataloguing devices for making attachments to concrete, brick, stone or hollow tile walls, has been prepared by the Star Expansion Bolt Company, 147 Cedar Street, New York City.

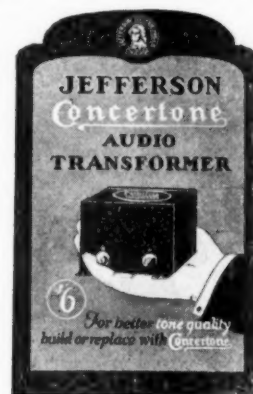
The Hoyt Metal Company, Boatmen's Bank Building, St. Louis, has issued a booklet giving data on the use of Babbitt metal for motor bearings.

The Frank Adam Electric Company, with headquarters in St. Louis, has consolidated with the Stewart Electrical Manufacturing Company and the Electrical Sheet Metal Works of San Francisco. The new concern will be known as the Stewart Works of the Frank Adam Electric Company. Offices will be at 425 Folsom Street, San Francisco.

New distributors for the fans made by the Emerson Electric Manufacturing Company

have been appointed as follows: The Electric Corporation, San Francisco and Oakland, Cal.; Southern Equipment Company, San Antonio, Texas; Robbins Electric Company, Pittsburgh, Pa.

The Jefferson Electric Manufacturing Company, 501-511 South Green Street, Chicago,



is distributing a die-cut display card to all dealers who handle its radio products.

Effective January 1, 1927, the use of the name of the Johns-Pratt Company will be discontinued and the business of that organization will be continued under the name of Colt's Patent Fire Arms Manufacturing Company. This change, it is announced, is in corporate name only and the trademark, "Noark," will continue to identify the products with which it has been associated for many years.

It has been announced that the recent fire in the plant of the Enameled Metals Company, Pittsburgh, will not interrupt the production activities of the company. Though the fire resulted in damage amounting to \$50,000, it was confined to one corner of the building containing the enameling department.

The F. W. Wakefield Brass Company is sending to the trade its new "Attachette"



demonstration unit, one of which is illustrated here.

The Electric Controller and Manufacturing Company, Cleveland, has appointed the Farr Electric Service, Inc., Salt Lake City, as sales representatives.

E. H. Schwab has been elected president of the Splittorf Electrical Company, Newark, and has announced that the company will extend its activities into the field of electrical appliances for the home.

Election of W. F. Barrett to a vice presidency and of G. W. Mead to membership on the board of directors of the Union Carbide and Carbon Company took place recently.